The Builder.

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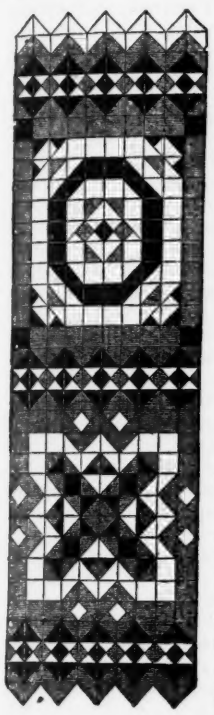


The Workmen's Exhibition, Paris.

In a previous occasion we alluded to the efforts made by the working men of France to organise an exhibition which should be purely representative of their class. Applications were made for space to be devoted to this purpose at the International Exhibition; but the movement was viewed with great jealousy by the authorities; at least, during the reign of the Gouvernement de Combat. The workmen's position is an anomaly in France. The right of association is not yet definitely conceded. Practically, the police does not now interfere with the trade-unions representing the members of one particular trade, and each restricted to its special locality; but directly these different societies begin to associate, then the authorities take alarm; and, availing themselves of unrepealed laws against coalitions, dissolve these too ambitious societies. A Workmen's Exhibition would tend, it was feared, precisely in the same direction. It would facilitate a federation between the various trade-unions, and hence the opposition which has impeded the Exhibition. With the advent, however, of a more liberal form of government, these susceptibilities somewhat subsided; and a Workmen's Exhibition was not only held, but actually opened by a member of the Government,—the Minister of Agriculture and Commerce, the indefatigable M. Teisserenc de Bort. It is true that the space allotted for the Workmen's Exhibition is not within the Exhibition grounds; but it is so close to the Porte Rapp, the principal entrance, that it can be easily visited at the same time as the great Exhibition. Nor can the charge for admission, limited to the trivial sum of 25 centimes, have a deterrent effect.

The structure, we must confess, is plain. It just suffices to afford shelter for the exhibits; and, barring the fact that it has been built by the workmen themselves, without any middle-class assistance, it has no further feature of interest. On the other hand, we must make allowances for scarcity of funds. The Municipal Council of Paris voted 2,000*l.*, and the General Council for the Department of the Seine voted 800*l.*; but these subsidies could not go far. Then another difficulty arose. A great many workmen were anxious to exhibit various inventions, but could not afford the money to secure letters patent; and feared that their ideas would be pirated if publicly exposed. A decree from the Ministry of Commerce finally removed these objections; but it was not issued till May, and the exhibition itself could not be opened till June. It is now decided that all objects exhibited shall be protected by the law in the same manner as if they were patented, during the time of the exhibition and for three months afterwards. The exceptional guarantee thus offered will not in any way interfere with the granting of a regular patent should the exhibitor ultimately desire to obtain this protection. If, however, all has ended well, there have been, it will be seen, many delays; and, for a long time, it was very doubtful whether the exhibition would ever be held at all. These facts have not helped to render the show particularly attractive, and it would not be fair to judge the results without taking into account the difficulties which have beset the promoters of this curious exhibition. It is, nevertheless, well worth a visit, and it is important to know what the workmen, unassisted by employers, have been able to accomplish in spite of the opposition they at first met from the Government.

On entering the grounds that surround the building, it is at once apparent that many of the objects exhibited are of direct interest to the building trades. Thus, M. L. Lefèvre, 67, Rue Picpus, has a system of glass roofing for hothouses, &c., fixed without the assistance of putty, plaster, or any sort of cement, and which will nevertheless exclude water. This consists of a zinc frame-work on which the glass is fitted. Wherever a joint occurs, and a slight leakage might result, the edge of the frame is curled up underneath the edge of the glass, so as to form a little gutter, about ¼ in. wide, which will drain off all the drops that may filter through. The plan, however, is inferior to some patented in England. M. Paul Thué, 3, Rue Linne,—we give the address, for these are not tradesmen but individual workmen, who, for the most part live in lodgings, and whom it would be difficult otherwise to find,—has an appliance for holding slates on a vertical roof. This is a small wire contrivance which stands out in the form of a Y. The tail of the Y is passed between two slates, while the arms stretch out over the lower and middle portion of the slate above. Thus, between each slate a forked-shaped grappling wire protrudes, to be pressed down upon, and to hold the slate placed above. It is to be feared that the action of the atmosphere cannot fail to corrode in a comparatively short time these small wire supports.

On the opposite side of the little garden there is an ornamental façade and colonnade in plaster, built by the Plasterers' Trade Union, to demonstrate how well plaster can imitate stone, and more particularly to demonstrate the ability with which the workmen can utilise these qualities. Close by, M. François Perrière, mason, 45, Avenue de la Labourdonnaie, has some partitions conceived for the purpose of excluding sound. The composition with which the partitions are made is very light, and gutta-percha piping of about 4 in. in diameter is used to prevent sound travelling through the partition.

M. Chevalier, 33, Rue de Linne, shows some imitation stone which is worth looking at.

On entering the building itself by the central and principal door, we encounter at once the political colouring which the workmen could not refrain from imparting to their Exhibition. A huge square stand with shelves all round is the central ornament, and holds the most attractive objects in the Exhibition. This pyramid of shelves or counters culminates in a sort of catafalque, where a ghastly chalk cast of Raspail's head rests on black velvet. Beside it a gigantic crown in black and white beads commemorates the mourning of the working classes for their lost friend and veteran champion. It bears the simple inscription, "À Raspail, les Ouvriers de Paris reconnaissant." The French have often been accused of ingratitude, of forgetting the good men they have lost; any symptom that may serve to contradict this unfavourable impression should be welcomed, even though introduced where more hopeful and joyous thoughts should be engendered. The thoughtful French workmen do not pretend, however, to participate in the proverbial Gallic gaiety. Their position is fraught with anxiety and humiliation. There is not a workman in Paris who does not remember the loss of a good friend or relation shot or transported a few years ago; and those who remain must suffer from the depression of trade and from laws aimed solely against their class. While architects, surveyors, engineers, doctors, members, in a word, of every other class, nationality, and profession, have held congresses in Paris,—have met freely and discussed freely,—the French workmen were forbidden to unite in congress, and the police arrested those who came to discuss working-class questions in Paris. Under such circumstances it is not surprising if a shade seems to hang over the Working Men's Exhibition; and, when so many men are arraigned against them, they are naturally inclined to pay special honour to the memory of so true and rare a friend as the people's doctor, the Socialist and Republican deputy, the well-known apostle of camphor as a universal remedy, and the oldest member of the National Assembly, M. V. P. Raspail.

Below these mementoes, and facing the entrance, there is a handsome bronze copy of Malarmet's Republic of 1848, which is certainly preferable to Clesinger's Republic of 1878. Contrary to Republican principles, Malarmet also gave his Republic a sword, but it is pointed downwards in a purely pacific manner, and its blade is bared only to shield the tablet of the Constitution, and the triangle, the emblem of fraternity. To the left of this familiar statue, M. F. Lassaux gives his notion of John Brown, in terra cotta, with a released and grateful negro at his feet; while on the right-hand side, M. Eugène Buffier, 130, Rue de l'Ouest, has a model of a clock in chalk, designed to represent the working classes labouring and learning. A handsome workman is sitting by a carpenter's

table, he is resting and reading. The contrast between the attitude of bodily rest and mental concentration is well rendered.

All round this central stand there are several objects of art worthy of notice. M. J. B. Bourgoin, 26, Rue Paradis Poissonnière, for instance, displays several statuettes in terra cotta, some coloured, all pretty, and a few humorous. M. Toulouze, 10, Rue de Génève, has some handsome portraits on plates; M. Taillandier, 13, Rue du Pré, exhibits some specimens of porcelain of high merit; and M. Goffaux, chalk mouldings. In other parts of the exhibition we admired, among the art work, M. Margotteau's cupboard. It is 8 ft. high, and consists of solid wood, sculptured; Diana on one panel faces Leda on the other, while Venus reigns triumphantly over both. There were several other specimens of wood carving, but not of equal importance. M. Alfred Gauvin has contributed some delicate iron *repoussé* work, and we found a looking-glass frame in mosaic, stated to comprise two million pieces! On the whole, however, the art-work was not as good as we should have expected at the hands of French workmen; some of the porcelain was quite inferior in colour and design, but, after all, at the great Exhibition, and under the name of celebrated firms, there are triumphs of art workmanship shown which are due entirely to the skill and taste of the Parisian artisan working under proper direction.

Among the various objects which workmen have exhibited, we may enumerate toys, musical boxes, a few pianos, some castles cut out of cork, a good deal of sempstress's work, a few dresses, samples of tailoring work, artificial flowers, Berlin wool work, pipes in meerschaum, &c., microscopes and other implements of precision, surgical instruments, bandages, guns, rifles, and a very beautiful model engine. There is, of course, the inevitable patentee who professes to have discovered a new folding-chair which can be converted into a bed or sofa, and finally rolled up and "carried away under the arm,"—of a giant, we might add. We have also two or three new fire-escapes; and notably that of M. Lamon, which consists of an inexpensive rope ladder rolled up and fixed at the summit of theatres and similar places. It can be detached in a moment, and hangs in front of the window by which the persons inside the building are the most likely to make their escape. This precaution could be easily taken and utilised long before an ordinary fire-escape could be brought upon the scene. It is to be hoped the material is fireproof.

Among the various ingenious contrivances, we should, perhaps, mention M. J. A. Markowski's (78, Rue des Cascades) velocipede. This consists of four wheels, and is worked by four persons. It occupies, nevertheless, very little space, and is remarkably light. Again, M. Halon (75, Rue de Dunkerque) shows a stove where, instead of iron bars to keep the coal in its place, he has copper tubes. These are filled with water, and carried off to any distance. Thus we can have a *bain-marie* some way off from the fire; and hot water is naturally produced much sooner. M. A. Baudin has devoted himself not to the production of heat, but to the prevention of fire. He has a patent solution which will render clothes, paper, wood, carpets, curtains, furniture, &c., fireproof. This invention has been patented, and, we believe, applied at the Grand Opera House, the Opéra Comique, and the Théâtre-Historique. If it is really efficacious it could be used in a thousand manners, and might on many occasions prevent disastrous fires. Finally, M. Doré, on his side, exhibits a liquid solution which will render the walls of a house, and even plaster partitions, quite watertight. It is also useful for the preservation of paintings, and of iron against rust. We regret that we were unable to obtain a sample and make some experiments to test its efficacy and its commercial value.

Such are some of the points of interest in this peculiar exhibition. It seems but as a Lilliputian bazaar when compared to the giant on the Champ de Mars; yet it may be the germ that will develop a good growth. The French trade unions are determined to become, not merely benefit associations, but great co-operative trading and producing companies. Thus this small Workmen's Exhibition may mean something far more important for the distant future. In the mean time, however, we must acknowledge ourselves disappointed with this exhibition, taking it as a whole. There are things of note and interest in it; but we are convinced that if the Paris workmen enjoyed a few years of the liberty which, in defiance of the Republic, they do not yet possess, they could make a far better display of their products. The exhibition also fails entirely in the international character it professed to assume; but, after all, if we consider all the impediments which were to be overcome, we must not withhold our congratulations to those workmen who have achieved a partial success where others might probably have done nothing.

SEWAGE IN THE THAMES.

A motion made by Mr. Richardson, at the meeting of the Metropolitan Board of Works on the 27th of September, was, to the credit of that body, carried unanimously. It was to the effect, "that it be referred to the Works and General Purposes Committee to consider and report on the statements made that the water of the River Thames, when the unfortunate accident to the *Princess Alice* occurred, was 'poisonous,' and 'its taste and smell something it was impossible to describe,' and whether such state of the water, if correctly described, arose from the main-drainage outfalls." The only rider that we would wish to put to so excellent a motion would be to the effect that competent testimony should be adduced, and that impartial judgment should be passed. In the conflict on which the Board of Works have entered with the Conservators of the Thames, and with all persons who desire to promote the purity of our chief river, they have hitherto had the great advantage of receiving violent and unmeasured attacks. Such attacks it is easy to repel,—and then the victory remains with the defendants. Of such victories they have known how to make the most adroit use. Now if we look at the speech with which Mr. Richardson supported his motion, we shall see that the inquiry may be so conducted as to result in the same sort of victory that was claimed as to Capt. Calver's report. "As regarded the assertion that had been made that 500 or 600 persons had been poisoned by the discharge of sewage from the Board's outfalls, Mr. Richardson gave such statement the most unqualified denial." No doubt. We quite assent. Such a statement would be incapable of proof, if correct in the main. Beyond that, we do not hold that it is correct in the main. That the melancholy loss of life referred to was caused by drowning is a matter as to which no juror could hesitate for a moment. Whether that mode of death was, or could be, embittered by the greater or less impurity of the water in which the sufferers perished is, we cannot doubt, equally incapable of proof. We hope, for ourselves, that it was not possible for such to be the case. If the matter is put on this issue, the verdict will be for the Board of Works.

But it is quite another thing as to the state in which the wreck and the remains in it were found after a few hours of submergence in the neighbourhood of the Barking outfall, although, be it noted, up the stream. It is quite another thing as to those who, having happily escaped with life, may be asked to give their own account of the water with which their clothes were drenched, and their mouths and chests more or less filled. Mr. Richardson, no doubt to the satisfaction of his colleagues, proved his case by a diagram. He showed the locality of the wreck, and the state of the tide at the time. Did he not see that this only made the indictment more formidable? Had the wreck occurred below the outfall, and during the discharge of the sewage, it would have been said that the case was exceptional. During half a tide half the sewage of the twenty-four hours is poured into the river. When the river is not swelled by floods, less than seventy millions of gallons of fresh water run down during the hours in which sixty millions of gallons of sewage are run out from the two outfalls. Any obstacle caused to such a discharge, the Board might safely allege, will naturally cause a deposit of sewage. "It is unfortunate, but unavoidable." But the real case is very different. The two points have to be kept apart, viz., the condition of the wreck, and the perception of those who were submerged, but not drowned. As to the latter, their personal evidence will probably carry more weight, at least outside the council-chamber of the Metropolitan Board of Works, than the most elaborate diagram. As to the former, Mr. Richardson's diagram goes to furnish direct proof of the statement made by Captain Calver, and denied by the Engineer of the Metropolitan Board, to the effect that the sewage makes its way up the river, and forms solid deposits in its channel. In fact, the statements made as to the indescribable condition of the wreck should be read side by side with the following paragraph of the report of Messrs. Bazalgette, Law, and Chatterton,—"We have shown that there is no documentary evidence to prove that foul and offensive accretions have recently formed within the channel of the Thames."

But while assenting with alacrity to an inquiry which, if the issue raised be "drowned or poisoned," must, of course, be decided in favour of the former, the Board hold firm to their position that crude sewage is neither noxious nor offensive. Having given, as our readers will remember, not a little attention to this subject, we cannot but feel some satisfaction on seeing the Board thus nail their colours to the mast. Mr. Cook said that, "from his judgment, he did not believe, in respect to the discharge of the sewage at Barking, that it was either one or the other,"—that is, either noxious or offensive. The entertainment of this belief by the members of the Board of Works may account for the scant courtesy and unmitigated hostility with which they hurled back to the Conservators of the Thames the report of Captain Calver. But what is more difficult to understand is, how any one can honestly entertain such a belief. It is not stated as a question of less or more,—as a matter of difficulty and of regret,—but as a positive fact. "The works," said one member, "which the Board had effected were amply sufficient to take away all the sewage from London, not only at present, but for many years to come." Positive enough, and comfortable enough, for the Board; but, unfortunately, not the statement of an expert or of an impartial judge. Mr. Cook and Mr. Runtz "objected altogether to the implied assumption that the sewage at all contaminated the river!" Mr. Fowler followed on the same side, and said that "it was a popular fallacy to imagine that solid sewage was discharged into the Thames." We should like to know the meaning attached to this expression by the speaker. What is a fallacy? or what is "solid sewage"? Of the latter we do net remember to have heard. Of crude, raw, or undiluted sewage, whether putrescent or only putrescible, we have heard. That is what is thrown into the Thames; and we should be delighted if Mr. Fowler would prove that this statement involves a fallacy, popular or otherwise.

The unanimous, or at least the preponderant, belief of the Board in the innocuous character of anything but "solid sewage," was somewhat rudely opposed by one member who had the misfortune to know what he was talking about. Mr. Jackson is a resident in the neighbourhood of the outfalls. He was, unfortunately, not provided with a diagram, and, therefore, being reduced to the fallacious testimony of his own senses, "bore personal testimony to the offensive character of the discharge from these, and which floated up and down the river on the tides." We regret that here the report ceases to be verbatim. We should like to know with what sort of a chorus of disapproval poor Mr. Jackson's personal testimony was received. It was indeed a heresy! A member of the Board to find anything proceeding from their works to be offensive! At all events, such a novel and altogether unexpected defalcation seems not to have troubled the majority. The second original motion of Mr. Richardson was,—"That it be referred to the Works and General Purposes Committee to consider and report whether the sewage discharged into the river at the Board's outfalls could not, at a moderate cost, be so purified before its discharge as to render it innocuous and inoffensive, as well as free from solid matter." "That will never do," said the Board. "If they voted for that resolution," said Mr. Cook, "they would be condemning themselves, as by so doing they would admit that they discharged into the river at the outfalls sewage that was noxious and offensive," but which, as before said, he did not believe was either one or the other. It is pretty clear that either the medical profession, sanitary reformers in general, the Rivers Pollution Commissioners, and Parliament on the one hand, or the Metropolitan Board of Works on the other, are utterly and frightfully wrong in this matter. The former authorities all agree that crude sewage is not only an offensive and disgusting compound, but that it is a substance dangerous to health; and

one the destruction or oxidation of which is one of the chief and most difficult duties of the engineer at the present day. The Metropolitan Board of Works, overruling the recalcitrant Mr. Jackson, declare that this compound is neither noxious nor offensive. "Well," says Mr. Richardson, "not perhaps positively noxious and injurious, but most decidedly offensive." "By no means," replies the majority of 19 to 7. So even the modest amendment, to the effect that the Board should inquire whether the sewage could not, "at a moderate charge, be purified before its discharge," was put and lost, and the inoffensive and innocuous character of crude sewage was thus adopted as one of the principles for the defence of which the Metropolitan Board are determined to use their own great powers,—and the money of the ratepayers.

This is not subject of congratulation for those who pin their faith to the wisdom of public bodies at large, or of a certain public body in particular. But we confess that we have read the account with some satisfaction. It is well that the question between the Conservators of the Thames and the Metropolitan Board of Works should be defined. "You are polluting and injuring the river," said the former. "We are within our rights," was the reply. The indictment was met by a demurrer. We pointed this out at the time and we also intimated that, sooner or later, the legal reply (if a reply) would not be enough, and the case would have to be discussed on its merits. This has come to pass sooner than we anticipated. The safe, if ignoble, shelter of the demurrer has been abandoned. The Board has gallantly gone in for an issue of fact. How far the outfalls at Barking and Crossness are, or are not, authorised by the Metropolitan Acts of Parliament no one but a lawyer can form an opinion. As to the offensive or non-offensive nature of sewage, every one provided with a nose can form an opinion. Nor can we for a moment doubt that, however large the majority that may support the view of Mr. Runtz within the Board, he will find himself in a very small majority outside of that charmed circle.

Even on this head, however, trouble looms on the horizon of the Metropolitan Board of Works. Our readers may remember that on the 3rd of August we ventured to express the opinion, founded on as careful a study of the case as we were able to make, that the Metropolitan Board had not the legal right to throw crude sewage into the Thames. In the *Times* of the 28th of September there is a letter signed "Lex," which speaks with remarkable precision on this point. We should not, as a rule, quote the opinion of an anonymous writer as being likely to add much weight to anything which we have taken the responsibility of bringing before our readers; but in the present case the publication of so positive an opinion, under so significant a signature, is so far clothed with the editorial authority of the journal, that it is inconceivable that it should have been allowed so to appear unless it came from the pen of some person competent to speak without hesitation as to what is the law of England. The letter is remarkably incisive. It goes straight to the point, and does not contain anything that we are not disposed to endorse. "I submit," says the writer, "that it is wholly unnecessary to issue a Royal Commission to make further inquiry. All the facts are known. Fresh action must be taken at law or in Parliament. If by law, the City of London and Conservators of the Thames should do what is necessary. THE MASTER OF THE ROLLS WOULD ISSUE AN INJUNCTION AT ONCE IF APPEALED TO; and the only question to be decided is,—Is the Metropolitan Board of Works entitled to pollute a river by sewage unpurified, which is an illegal offence in every other part of the kingdom?" On the 25th of September a letter in the same journal, under the signature "C. E.," recited the authorising clauses of the Metropolitan Acts of 1855 and 1858, and pointed out that the conditions "so as not to commit a nuisance" and "so as to prevent the sewage passing into the Thames within the metropolis" were embodied in those clauses.

Thus the matter draws towards an issue. Good at times springs out of evil. The melancholy catastrophe of the *Princess Alice* will not have been altogether without some good results if it has only wakened a persistent resolution, on the part of those who have been forced to look this terrible question in the face, that London shall not, so far as it is in their power to resist, be exposed to the slow but steady approach of pestilence, in consequence of the light-hearted resolution of the Metropolitan Board of Works that sewage is "inoffensive." "The question," says the last cited writer, "is not one of a few feet of deposit, or of a few millions of gallons of refuse. It is whether the Thames should be rendered the common sewer of a province containing four millions of people, because no one has the courage to test the sense of an Act of Parliament, passed at a time when no such evil result was anticipated." Another gentleman offered to subscribe towards a fund for trying the question at law, by an action against the Metropolitan Board of Works. It is desirable that efforts should not be frittered away. Any one who has enough of the courage of his opinions to offer thus to back them with his funds may be expected to give a hearty assent and aid to whatever may be found the most available mode of working for the common good. This mode we have some time since pointed out to be most readily attainable through the action of that eminently respectable body, the Conservators of the Thames. To this end both of the writers we have above cited point. "As far as it is possible for a layman to form an opinion on a point of law," says the civil engineer, an injunction would be issued "if the Thames Conservancy Board were to apply for an injunction against the Metropolitan Board of Works." "The Master of the Rolls would issue an injunction at once, if appealed to," says "Lex" in the *Times*. So far as we can judge, there is likely to be a remarkable unanimity on this subject in the press. Who, indeed, would venture to stand forward as the advocate of the pollution of the Thames, or of the innocuous character of crude sewage? It is one thing to make courageous or jocular remarks in a snug room, when nineteen out of twenty-five of your companions are ready to applaud them; it is another to submit to the more searching criticism that attends on written or on printed matter. We should like, for instance, to see any one who would venture to tell the public in print that "the whole of the sewage that was passed into the Thames from the Board's outfalls formed but about the proportion of one to the seven-thousandth part of the stream." Yet that ridiculous mis-statement is not only reported as being made uncontradicted at the Board, but commented on by a respectable contemporary, who seems struck with the disparity between the proved state of the stream, and the very small proportion of poison which, according to the member who hazarded the remark, has had such a fatal influence. The misfortune of these zealous advocates usually is that they reply one to another. The concrete, obvious, odious, fact is the unexpected discovery, owing to a fatal disaster, of a state of the Thames above the outfall worse than even that which Capt. Calver was laughed at for describing below the outfall. One member of the Board, with his diagram, calls attention to this fact of position, which is more damaging than any analysis hitherto attempted. Another says that he sees no harm in the outfalls; a third tells us that there is only one part of sewage in 7,000 parts of water! How much more pestiferous and deadly must that subtle poison be, if these gentlemen are right, than the advocates of public health have ever yet ventured to indicate! Truly, Mr. Richardson and Dr. Brewer are important witnesses,—the more reliable because of their hostile purpose.

The *Evening Standard* laments the resolution of the Board as a positive misfortune. We have spoken of it as a matter for congratulation. But there is little difference between us as to the bottom of the matter. We should have been among the first to rejoice, if the Metropolitan Board, on being afforded an unusually ready opportunity for repairing some of their worst blunders, had availed themselves of it as men of the world. "Really," they might have said, "we are, like all our fellow-citizens, so shocked at the revelation, that we will have the matter looked into thoroughly, and will concert with the Thames Conservators as to measures to be taken to carry out the demands of that important body. We are sedentary people ourselves, we don't go east of Charing-cross; but we were shocked to hear what one of our own members, who does, said the other day. We see the Thames so much clearer at Westminster than it used to be, that we took the word of our officers for it that it was pure all the way to the sea! We are disappointed; but the welfare of London above all things! After all, the great thing is to do what is grandiose; and perhaps as much advantage may be derived, by those who know how to derive it, from laying out a million or two in defecating sewage, as by building a bridge with a spiral ascent, or by making another crusade against the water companies. At all events, what must be, must be." But as this has not been the tone taken, again we say that all who are for the salubrity of the Thames must rejoice that the Metropolitan Board have nailed their colours to the mast, and given the public to understand, once for all, that they consider that there is nothing offensive in raw sewage, and that they have no intention of paying any heed to the purity of the Thames unless they are absolutely compelled so to do.

At all events, there can be no illusion now remaining on the minds of those who have looked for something like respect for the representations of the Thames Conservators on the part of the Metropolitan Board. What is at present essential seems to be this. The two parties are now fairly marked out:—London and its authorities and inhabitants, the persons engaged in the commerce of the Thames, and the riparian inhabitants of the Lower Thames Valley, supported by the press, on the one hand; the Metropolitan Board on the other. Success can only waver on the view that the minority is so compact—the majority so scattered and unorganised. We therefore urge that those who take a lively interest in the matter, those who are ready, like the writer in the *Times* the other day, to put their hands, if need be, into their pockets, should, in the first instance, give a prompt and signal moral support to the only body that has already moved in the matter—the body to which, at all events in the first instance, we have to look for action. The writer in the *Times* suggested the opening of the campaign by memorialising the Conservators of the Thames. We think the suggestion so practical, that we subjoin the draft of a memorial to carry out that suggestion.

"To the Honourable the Conservators of the River Thames.

The memorial of the undersigned citizens, householders, and residents in London, and in the Lower Valley of the Thames,

Respectfully sheweth,

That your Honourable Board has been constituted by Parliament for the conservation of the Thames and of the Port of London, for the preservation of the Thames from encroachments, and for the security and convenience of the public.

That penalties are provided by the Thames Conservancy Act, 1857, to be imposed on every person who shall unload, put, or throw into any part of the River Thames any rubbish, earth, ashes, dirt, mud, soil, or other matter, or allow any offensive matter to flow into the Thames.

That by an Act of Parliament called the Metropolis Management Act, 1855, the Metropolitan Board of Works was authorised to execute certain works, namely, to make all such sewers and works as they may think necessary for preventing all or any part of the sewage of the metropolis from flowing or passing into the Thames within the metropolis, and that they were authorised to dispose of the sewage and refuse of such sewers as they may see fit, but so as not to create a nuisance.

That notwithstanding these obligations to provide for public health and decency, the Metropolitan Board of Works have turned the sewage of the metropolis in a crude and unpurified state into the channel of the River Thames at Barking and at Crossness, thus creating a nuisance of the most noxious description, and allowing the sewage to flow into the Thames within the metropolis during each nate period of the rising spring-tides.

That the members of the Board have declared, as recently as the 27th of September, 1878, that in their opinion such disposal of the raw sewage of between three and four millions of people is not only innocuous but inoffensive.

That the report made to your honourable Board by Capt. Calver, R.N., dated the 15th of October, 1877, concluded by expressing the wish 'that the noble metropolitan river committed to your care may be freed from a drawback which is impairing its convenience and usefulness, and which must continue to do so at an increasing rate without an effectual remedy is speedily applied.'

That your memorialists have been advised and do believe that the discharge of crude sewage into the Thames by the Metropolitan Board of Works is a violation of the provisions of their own Act of Parliament, as well as of the general provisions of the Common and Statute

Law regarding nuisances; and constitutes a serious peril to public health, and to the navigation of the Thames.

That they are further advised and do believe that a remedy at law may be readily obtained by your honourable Board, if they should apply for an injunction to prevent the continuance of this dangerous nuisance by the Metropolitan Board of Works.

That your memorialists therefore pray your honourable Board to take such steps as in its wisdom it may think fit for the immediate obtaining of such injunction, reserving the faculty of applying to Parliament for further powers to protect the public interest should such hereafter appear to be necessary.

And your memorialists will ever pray, &c."

THE ARTIST AND HIS WORK.

A TRULY great work of art is something more than a mere specimen of manipulative dexterity,—it is the visible expression of inward emotions, the manifestation, in a material form, of the intellectual appreciation of the beautiful. The true artist imparts to physical beauty an intellectual beauty, and interprets the spiritual language of inanimate nature. He places objects, whether animate or inanimate, in their best position, and throws upon them an ideal light which awakens the highest sensibilities of the beholder. He ascends from the effect to the cause, and gives expression to his deepest thoughts and most subtle imaginings.

To reach this high level much toil and striving is required. There is no such thing as a "heaven-born artist." The greatest genius can only display itself after unremitting travail of the soul, and by ever keeping in view a noble aim. It is your weakling,—he who finds the pathway too difficult to traverse, and never thinks of cutting one out for himself, who endeavours to reach the goal at a bound; and various are the means by which he attempts to do so. He prates about drudgery and the dignity of his mission, and will not condescend to adopt the ordinary means placed at his disposal. He affects what he calls originality, but what is simply oddity and singularity, although his friends may dignify it by the name of eccentricity.

Confident self-assertion and unbounded impudence often make themselves conspicuous when modest worth is overlooked, but in the long run true merit is sure to be recognised, although it may not always secure the reward during a lifetime. It is really startling to see some of the productions palmed off as examples of high art, works in which there is not the slightest attempt at the union of the possible with the ideal, in which there is perhaps a vague suggestiveness, but no combination of thoughts. There are some who affect to admire such whims and vagaries, to see in them a subtle beauty which is invisible to the uninitiated, but there are others who see through the flimsy superficiality which is adopted as a covering for the absence of those sterling qualities which can only be obtained by hard work and study. He who has by genuine study acquired a mastery over technical requirements, whose hand answers to his brain, needs not to indulge in extravagances, but restrains himself within due bounds, and is not necessarily a slave to academic formula; his work may be the result of painstaking care, and yet that may not be apparent. A suggestion of detail is much more true to nature than an elaborate delineation of each separate part; for when that is attempted the stereoscopic effect of nature is lost. To produce a really natural effect the artist must concentrate his efforts in giving emphasis to the leading incident or phase, and make the remainder subordinate thereto. As it would be foolish in an author to write a whole chapter in italics, or for an orator to give emphasis to every word of his speech, so would it be for the artist to make every object in a picture equally important, or to place each in a strong light. Genuine suggestiveness can only be acquired by study, and is much more difficult of attainment than the more mechanical process of direct imitation. But slovenliness must not be mistaken for suggestiveness: the material or medium used then becomes too obvious, it obtrudes itself, so that the canvas seems to smell of paint, the parts do not blend together, and there is no harmony of effect.

There are some who look at everything through the narrow casement of their own chamber, and fancy they see the whole world, and the portion of it they do see is viewed through a distempered medium; the glass is full of flaws and gives to objects a distorted aspect. The time is past when we accept an attenuated figure, with head twisted to one side and hands stiffly crossed on the breast, as an adequate representation of saint or martyr. Nor will a refined taste be satisfied with the morbid obtrusion of human suffering and agony, or anything that is repulsive or forbidding. Art should attract and not repel, produce pleasing and not painful sensations; it aims at the realisation of the beautiful, and the subject, whatever it be, should produce pleasure, whether it be by awakening our sympathies for suffering or inviting us to rejoice with the happy. "Art should be an instrument of progress by always selecting the best phase of every individual, the best form of every type, *i.e.*, the Ideal." But while art is an instrument of progress, its province is not to teach morality; it may, indeed, and should, express what is noble and good, but unobtrusively, for wherever it obtrudes virtue it fails as art. The images it presents should awaken pleasing associations, but whenever the associations aroused are vicious, then the art is low art; for "in proportion as a mind is high in the scale of humanity, the objects of its Love are certain to graduate towards Beauty": not mere sensuous beauty, but that spiritual beauty which pervades all the works of the Creator.

In order fully to apprehend a work of art, the spectator must be possessed of a nature alive to sympathy, a sensibility to outward impressions, and have an eye keenly alive to beauty of colour and grace of form. And although he has not been taught morality by the study of art, the measure of his moral nature may be gauged by his appreciation of it. "The man who loves nature most will be always found to have most faith in God," says Ruskin; and why? because nature is the visible manifestation of "Him in whom we live and move and have our being."

The love of the Beautiful, whether in nature or art, differs only in degree from that which is kindled within us by what is good and noble in living action. A work of art is the embodiment, in a visible form, of inward emotion, and speaks more directly to the initiated than any other product of man's brain. "Exact imitation is not necessary to reverence." It is not the outward seeming which engages the attention of the true artist so much as the underlying sentiment and evanescent expression which he endeavours to arrest and retain; and he will be the greatest who, filled with the spirit of the times, gives expression to them, not he who repeats, in however dignified a form, the supposed expressions of a bygone period. "It is the genius of the hour which always sets his ineffaceable seal on the work and gives to it an inexpressible charm for the imagination." Each man will ultimately be judged by the amount and value of the originality in his work, and originality can only be obtained by freedom of action. The worship of precedent, the slavish adherence to dogmatic rules, is destructive to originality. The value of a work depends upon the creative power and the good taste and judgment displayed in its execution. Mere fluency of expression and elegance of diction will not suffice unless there are ideas conveyed; if devoid of ideas the result will be,—

"A thing of little meaning, though the words be strong."

Manipulative dexterity will not alone suffice. The work of the scene-painter may be very clever, but it can never be classed as high art. Ephemeral works produced for the gratification of the passing hour cannot be placed on a footing with those which are the most precious gifts to posterity. Neither will mathematical exactness, a knowledge of history, anatomy, botany, and geology effect the purpose. These are all aids,—most valuable aids,—and in some instances absolute requisites, to the formation of the artist; but, unless he has the heart to feel, the handiwork will be jejune and spiritless. The conceptions of him who aims at a high ideal and falls short of it are often of more value than the more perfect productions of him whose ideas are trite and commonplace; but the sense of beauty must be displayed in every direction where the work is genuine, and not affected and superficial.

It has been said that in England we have no school of art, but merely scattered items of personality. There is no tribunal to which an appeal can be made whose decision would be received with anything like general approbation. It is unreasonable to expect that the artist will be satisfied unless his work is appreciated. He may, indeed, do much to satisfy the longings and aspirations of his own soul; he may have the strongest conviction that his work is worthy of approval; but without the stimulus of sympathy his mind is certain to be burdened with an incubus which he cannot throw off. If he secures the generous approval of contemporaries who have gained a good position, he may then, although unsuccessful in a pecuniary point of view, be satisfied that his labour is not in vain. But there is apt to be a spirit of rivalry amongst contemporary artists, who, in the heat of the strife, cannot, with coolness and deliberation, pause to adjudicate upon the works of those with whom they contend. The very fact of one artist taking up a stand-point, from which he views the field of art, acts as a disqualification to his freely gauging what does not lie within his immediate range of sight. A fine appreciation is not always combined with original invention. The approbation of him who has cultivated his taste by the study of art for its own sake, and is not swayed by professional predilections, may be of more value than that of him who has acquired a mastery over the technical requirements necessary to constitute the artist.

The world of art is under obligation to the world of letters, although it may affect to deny it. The writings of living authors have done much towards imparting to the public right principles, and have performed good service in calling attention to true merit, which might otherwise have been overlooked. W. G. S.

THE PIANOFORTE ARTISTICALLY CONSIDERED.

NOTWITHSTANDING all that we hear and see of "art-furniture," there is plenty of evidence that the taste of the regulation cabinet-maker still exercises its tyranny in many forms and over many varieties of household furniture. There are certain set patterns of the trade which you must take as you find them, or incur the expense and delay of having a specimen properly made to order. As a rule, the stock-in-trade of the furniture dealer, if he happens not to be an "art" man, consists of objects which are not so much in a bad style as absolutely without style of any kind, and shaped,

"If shape it may be called that shape has none,"

with reference to no motive either practical or artistic, but only in fulfilment of a long-acquired hereditary trick of the craft. The good which the move for art-furniture has done (combined as it is with a good deal of nonsense) is that it has brought into existence repositories of furniture in the making of which a better and more artistic trick of hand has been acquired, though it is often still a trick, got up to meet the demand of the day. But among articles which do not come so regularly into the art-furnisher's stock, the case of the man who wants something not annoying from its commonplace or pretentious appearance is nearly hopeless. We have known the most persevering research fail in discovering so simple an object as an umbrella-stand made in a simple and rational manner; even the plan of asking to see the cheapest form failing, for, however "cheap," there is always some "nasty" ornament, or what is supposed to be ornament, to be put on. Endeavour to procure an office elbow-chair: wherever you go, a particular form with a particular sort of unmeaning cut-out ornamental rails meets you; ask if there is not a plain one, and you will be stared at as an eccentric person; give an order for a plain one, and ten to one it is no use, and the thing comes to you cut (or cast as one might think) in the regulation mould. "Art-furniture" is not concerned as yet with these more utilitarian articles.

But it is certainly surprising that, in regard to one article of furniture which is usually the most prominent and largest in a modern drawing-room, and is certainly the most distinctly artistic and the least utilitarian in its associations, there should still be not an effort made systematically to provide it with an outer shell, such as a man or woman of refined taste can at least find suitable and unobjectionable. The pianoforte, like some of the humbler objects we mentioned, is not in the stock of art-furniture; in saying which we are by no means withdrawing our former condemnation of much which is called art-furniture, and, to a great extent, of the movement

which has invented that expression. Only we may recognise the said movement as the result of a desire for improvement in the artistic character of our furniture, and in that connexion cannot but be surprised that it has not laid any hold on a piece of furniture so important and so suggestive to the artistic designer as the pianoforte. One reason for this, no doubt, is that as the piano has to be made by its own special manufacturers, they, to a great extent, keep the case and the external treatment in their own hands; but another reason may be that the modern piano being necessarily altered in size and form from its older precursors, the harpsichord and spinet, there is no precedent in old furniture design to fall back upon; and "art-furniture," as we all know, lives almost exclusively on precedent.

But if we grant that the pianoforte-makers must of necessity have the case in their own hands, it might not unreasonably have been expected that they should have made some effort to keep up with the demand of the more educated public for improved artistic conditions in furniture. They are not in the position of common tradesmen, for pianoforte-making is itself more or less an art, and one demanding great knowledge and culture to carry it to perfection. But the pianoforte manufacturer is not a whit before the dealer in office-chairs in his notions as to taste to be displayed in the external design of his costly and elaborate productions. Suppose that an architect is asked by a client in the country, let us say (and this is an incident within our own knowledge), to choose for him from the stock of some leading maker a piano which may be not only good as an instrument, but have an artistic form and make, and good (if any) decoration, so as not to interfere with the harmony of the intending purchaser's tastefully furnished rooms; or if this cannot be had, at any rate to secure one with simple and at least unobjectionable forms, which may serve as the basis for treatment at the hands of a decorator. The architect goes, not very hopefully, to a very renowned firm, explains what he wants, and asks to look over their show-rooms, and the result is that it is absolutely impossible to find a single thing which any man regarding the matter from an artistic point of view would admit into his house. There is the usual form of "grand," with the legs like elongated decanter-stoppers; there is the regulation upright or cottage form, with cut crinkle-crankle panels in the front, showing a raw red or green silk through the perforation; and the key-board has its coarsely-moulded brackets or Gothic props of an approved pattern, and its lid elaborately twisted into a serpentine section, against the nature of wood, although the top of the keys is a flat surface, and would be more appropriately and closely covered by a flat lid. On the front of the piano are fixed two rickety tinsel-looking candle-brackets, probably not fixed to any firm portion of the woodwork, but as likely as not on to the flimsy perforated panel, which shows a tendency to buckle whenever the candle-brackets are touched.* The only things among the regular stock which are at all fit to look at are the specimens of the very cheapest model of the small cottage pianos, because in them no "ornament" at all can be afforded at the price, so they are left plain and so far unobjectionable, though weak-looking enough. Even the idea of getting a piano which can be designed upon afterwards by a decorative artist has to be given up, for the forms are too bad, to begin with, for any one to make them the basis of a good design. But as our visitor leaves the rooms, he catches sight of one instrument which he had not noticed before, put rather carefully aside in a recess. This has not a bit of what the pianoforte-maker generally regards as "ornament" about it: no red silk, no perforated panels, and no sinuosities; but it is solidly and well made, the few mouldings which form almost the only decoration are delicate and refined in execution, the pedals and the candle-brackets look as if they would do their work, and the whole, though (or because ?) almost the simplest-looking instrument in the rooms, is such as the most fastidious critic could not raise an objection to on the score of good taste. In answer to an expression of appreciation, the showman says, "Yes, that *is* a nice piano, sir; that was made specially for a gentleman who furnished a design for it." And, seeing that this perfectly satisfactory case has nothing specially costly about it, the question naturally follows, "Why don't you make others in that style, instead of these abominable things?" But all that can be elicited is, that "it is not our habit" to make any difference from our usual pattern, except to a special order.

This is a true tradesman's answer; and yet, as we said, the followers of so fine an art as pianoforte-making ought to rise a little above the tradesman in these matters. The heads of the great pianoforte houses are gentlemen of large means, and probably, at least, average culture; they might very soon improve public taste themselves if they would only get into the "habit" of thinking a little about the artistic appearance of their instruments, and endeavour to institute a more tasteful and sensible model. We say a model, because we admit that for the firm to be always designing new and various forms and decorations would not pay. There must be a certain recognised general form for the general run of the instruments, or they could not be supplied at the same price as they are. But why not at least endeavour to get hold of or invent a good model instead of a bad one; to knock off the "flummery" and vulgar finery, to make the construction truthful and sensible? The particular specimen mentioned just now was, it was understood, charged extra for the case; but there was no reason why that should have been if the same general model had been commonly adopted. In fact, it may be presumed that a perfectly good, tasteful, and unobjectionable form of piano may be produced at less cost, when once adopted, than the vulgar and tasteless forms which the trade generally seem quite content to go on repeating without the slightest attempt at improvement.

The existing regulation type of piano-case took its origin from the style of furniture in vogue at the time the grand piano was brought to near its present size and efficiency, and seems to have traditionally remained in the same state. The radical objection to the appearance of the average piano, whether grand or upright, is that it is a thing that is made to look showy by means of bad ornamental detail, of a cheap form, and designed with no thought or taste. Certain woods have become the stock material for cases; and it is considered enough to state to the purchaser that the instrument is in a rosewood or walnut wood case to entitle it to all respect from him, as a presentable article of furniture. It would be much better if the case were made of the plainest wood, provided some real taste and thought went to its decoration. As it is, the fact of a handsomely-marked wood is supposed to make everything go off well, and to counterbalance all the coarseness of detail. The objectionable character of the detail consists mainly in the weak and ineffective sections of mouldings employed; in the use of brackets or shafts (in the case of uprights) pretending to support the keyboard, and which are to be found in stereotyped forms which look as if cut out with a dinner-knife; in the needless twisting of the wood into curves which are, one may presume, thought to give a "handsome" appearance; in the vulgarity and utterly meaningless character of the additions of what can only in a spirit of satire be termed "carving," and in the miserable notion of giving colour to the whole by the bits of red, blue, or green silk stretched behind the inevitable perforated wood. We have before our recollection a specimen of one of the largest and most costly class of uprights by an eminent firm, and put forward as a specially fine instrument both in tone and appearance, in which the combination of brass gimcrack and wooden gimcrack, and the very strongest and most raw blue in the silk lining, was something almost insulting to the eye. Now we want to see all this kind of vulgar glitter done away with; and there is not the slightest reason why it should not be, if only some leading manufacturers will think it worth while to give the subject a little attention, and to institute a model which, if not emphatically a work of art, shall be free from ostentation and vulgarity, and therefore, at all events, not offensive to good taste.

What is wanted is, in the first place, that no part of the case should be rickety, either in fact or appearance,—it often is so, for the case is mostly a mere veneer put over the actual framework; and where it is really the only screen interposed in front of the mechanism, it is often so flimsily made that one cannot move the instrument about at all without shaking the case very much. This should not be. Everything should be solid and well put together, so that one need not feel afraid of damaging it in handling.* The lines of the instrument should be such as wood naturally takes,—straight lines, not artificially curved ones, which in an upright at all events are quite unnecessary, as the framework of the internal mechanism does not fall into curved lines; and the keyboard, as before observed, is a flat surface best covered by a flat lid. If ornament is added, let it be in the shape of mouldings at suitable points, carefully and finely executed, not in bad carving done after a regular pattern, nor flimsy sheets of pierced wood-work which appears ready to crack on your merely looking at it. Perforated wood design may be made to look very well and very tasteful, but what is put on pianoforte-fronts is rarely if ever so. Its usual object is apparently to make a sort of pattern in combination with the coloured silk which is strained in front to let the sound through; but if this silk front is considered a necessity, it would be far better, instead of putting on a raw staring colour, and then reducing it by filagree woodwork interposed, to choose some Oriental silk that is beautiful in itself, and has sufficient variety of design and texture to give surface and detail without putting over it a wooden tracery for this purpose. In some old instruments we have seen the silk in this position worked in a special design for the position, and left, of course, uncovered by any woodwork. This not only looks much better in itself, but it also affords an opportunity for imparting a little individuality of artistic design to the instrument; and in such a case the lady of the house, or her daughters, if they be given to and are expert in "art-needlework," may make their own design for the front of the piano, and indulge their own taste and fancy therein. If they also fall a little into mannerism and fashions inspired by South Kensington, they will at least produce something better than either the filagree woodwork with silk backing which is now in use, or the even more dreadful arrangement of silk strained in folds or puckers radiating from the centre of the panel, which was in vogue before the pierced woodwork was introduced.

It is not, be it observed, an absolute necessity that the front of an upright piano should be thus partially open and silk-covered, under the idea of letting out the sound. Wood, as every one knows, is an excellent conductor of sound, and it will be found on experiment that the difference in effect between a piano with a wood front and one with a silk front is of the very slightest. Indeed, it may be a question whether the silk, which possesses no sonority in itself, does not absorb as much sound as it passes. When it is desired to get a sharper and more brilliant tone than emanates from a covered-up soundboard, the opening of the top does it. The top of the upright piano is a portion of it which requires some reconsideration. It is always made flat, like the top of a bookcase, generally with half the top hinged as a lid and opening backwards. Now, there is not only no necessity for the top being flat, but it is even to be deprecated, because it leads to this portion being made a shelf for books and music, which is a bad thing for the effect of the instrument (checking sonority), and most inconvenient when the top is required to be opened. Every one must have observed how frequently in the course of an evening's music, when it is desired to open the piano to give more effect to a solo, there is quite a business in getting off the lid the music which has accumulated on it, and probably some one pushes it up before the clearance is effected, and then down go all Miss ——'s songs between the piano and the wall; affording opportunity, no doubt, for her admirers to show their devotion and agility in recovering them, but otherwise causing delay and annoyance. All this only results from the fact that the upright piano has never been treated naturally as the necessities and uses of a piano would dictate, but always under the traditional idea of form derived from a cabinet or bookcase. The instrument would look much better and lighter with a top sloped back, and there would then be no possibility of making a wrong and inconvenient use of it as a bookshelf. The shape of

* A practical nuisance also of these gimcrack things is that they almost invariably rattle and jingle when the instrument is played, and frequently have to be taken out of their sockets during the time when they would be wanted, if they were made so as to be of any use at all.

* An average upright piano is very seldom in possession for long without some part of the ornamentation having come off,—broken away at the merest touch, as if it were meant for nothing else.

the lower part of the instrument is in the same way dictated by a conventional method derived from other classes of furniture. There is no need that the lower part should be a square box over the whole length and breadth occupied by the instrument, any more than that the grand piano should be a square box of the length and width each way of its extreme dimensions. The piano is essentially a harp enclosed in a mechanical framework, and with a sound-board to give tone, and with the strings acted upon by mechanism instead of by the fingers. The sound-board naturally takes the harp shape; and it is the one good point in the design of the average grand piano that this shape is retained in its exterior, so that the instrument has its own characteristic general form, and there is no mistaking it for anything else. Now, the "harp" which is placed horizontally in the grand piano is placed vertically in the upright; the sound-board, with its strings at the bass or left-hand end occupying the whole height of the instrument, and diminishing towards the right-hand end. What is above the keyboard is level, what is beneath it is oblique. If it were treated accordingly, the lower part of the instrument would show an oblique line rising to the right, like the foot and raking side of a harp. If frankly treated in this way externally, a great deal more character would be imparted to the instrument, the lower part of which on the right of the player is practically merely an empty piece of casing, assuming the form of a square pedestal. The instrument would, of course, in any case require its right-hand support on the floor; and then the oblique soffit would, on our suggestion, be shown, with an oblique strut from the right-hand foot to strengthen the whole. And if candle-brackets be added to our piano, let them be of solid appearance and of honest metal, and not gim-crack-looking pieces of gilt scroll-work.* It seems almost absurd to have to add that they should be so placed and of such length as to be of real use in throwing light upon the music-desk; but as a matter of fact they hardly ever are so, and often will only throw so oblique a light on the page as to dazzle and confuse rather than help the performer in reading the music. Lastly, let us add that the back of the upright piano ought to be made as presentable as the front. At present it is always assumed that the back of an upright piano is to be placed against the wall, the worst possible position in which a piano can be put, either for sound or for convenience in singing to it.

The modern grand pianoforte, as has been observed, has the one merit in design of assuming externally the general form which is suggested by the internal construction; and that it does so is probably due in great measure, if not entirely, to the fact that it is the direct descendant of the old harpsichord, and the form of the modern instrument is based on that of the old one. Otherwise there is little doubt that the modern grand also would have been made into a great oblong trunk, and the spandrel space at the narrower end of the sound-board wasted. It is not, in fact, so realistic in form as the harpsichord, for the latter in all old examples we have noticed follows the precise line of the stringing frame, and at the narrow end is canted at an oblique angle instead of being squared or rounded at the end, as the modern instrument is. A difference between the old and the new forms in make is that the harpsichord has four legs, two close together at the angles of the narrow end; the modern piano has only one central support at the small end. This latter is undoubtedly the most convenient arrangement for moving, and, on the whole, the neatest in appearance; but the rounded form of the end, now most usually adopted, is not in accordance with the construction of the instrument, and is probably due to that love of curved lines which possesses the modern cabinet-maker, whose special syle of production, artistically, is exhibited in full force in a grand piano of the ordinary type. The same kind of criticism before applied to the ornamentation of the upright piano applies with equal force to the details generally characteristic of the larger class of instruments. There is less of gimcrack, certainly, about them; their size and weight necessitate solid construction to bear the strain of moving and lifting about; but the stamp of commonplace is on them as distinctly as on the others of their kind. The plainest are, as usual, the least objectionable; wherever the least ornament is added all pretence to taste and fitness vanishes at once. Polished and shining surfaces, thick bulbous legs of the ugliest outline and detail, and the eternal perforated woodwork in the music-desk and the panels flanking it, and the usual characteristics.

As in the case of the upright pianos, the elimination of all the ornament usually employed would be the first step in the right direction. One feels, however, in regard to a grand piano, that something more than mere utilitarianism is usually suitable and desirable. The instrument in this form is so large and costly that it may be assumed that those who can spend money on it can usually afford a little margin for decorative treatment. Such decoration should, of course, be executed on surfaces which naturally form part of the construction; it should never be an addition put on to look ornamental. The lid is frequently slightly bevelled at the edges (which in itself has a good effect); a little well-considered inlay ornament, even of the simplest kind, applied here as an edging to the whole, would almost in itself make all the difference between a bald and a sufficiently ornamented instrument. A lesson in regard to good taste might be taken from the violin-makers. A violin is really a work of art, for it is a production in which every portion is shaped in the best way for its purpose; and no excrescences or impertinences of ornament were permitted by the great makers. The received decoration of a good violin is a thin black band of ebony inlay lining out the edge, sometimes a double line, sometimes a triple line; this is called the "purfling," and a "trebly purfled" old instrument has increased value from the existence of this very suitable, refined, and permanent method of decoration, the treble purfling being also generally an indication that the instrument is of special excellence in other ways, as extra care has probably been given to it. The front of the piano (to return) above the keyboard, when the piano is opened, is a good place for a little ornamental treatment, on the under-side of the lid; and it would certainly be in better taste than the statement with which this part is generally alone ornamented, that "Brown & Brown" made the instrument, followed by their address. This is another matter in which the violin-makers have the advantage in point of taste: they do not advertise themselves on their instruments; the maker's name can only be found in its place on the inside of the back, when looked for narrowly. If we wish to carry decoration further, we may get some hints from the old pianos, or rather spinets and harpsichords, in the South-Kensington Museum. The very pretty treatment of the ends of the keys, carved with a sunk ornament, which seems to have been the favourite fancy in Italian instruments at one time, is worth attention; so also is the idea of decorating with painted ornamental design the under-side of the lid of the instrument, which when raised for concert-playing of course faces the audience, and makes thus a decorative background. This seems more suitable than elaborately ornamenting the upper surface of the lid, which, when down, is of course not much seen, and when up is always turned from the audience. Fancies have prevailed sometimes for variously coloured keyboards; black for the long keys and white for the short ones, or tortoiseshell and some other material that contrasted with it, &c., but this cannot be recommended. Not only do the ivory and ebony form the cleanest and most clearly-cut keyboard in appearance, but the look of these white and black keys is indelibly associated with the piano in the minds of all lovers of those "beautiful cold keys," as an enthusiast once called them. And it is according to all sound principles that the decoration should be applied to the parts which form the framework of the keyboard, not to the actual keys which do the work; at least, not to their surface, the lights and darks of which are a great guide to the player, who can still catch them with the eye when not looking directly at them. This is, in fact, the one portion of an ordinary piano which is made in accordance with common sense and practical suitability; and the application of the same degree of common sense to the whole design would be the best basis for improved artistic treatment of the piano.

* Messrs. Broadwood alone (as far as we have observed) have improved on these absurd brackets, and have placed on their best recent upright models solid-looking metal brackets of plain and suitable design: though in regard to practical efficiency in lighting these are still deficient, being usually too short and too far from the music-desk.

A PAPERHANGER'S FACTORY.

The paperhanger, so termed, is, to employ the modern phrase, an important factor in the fitting up of houses after their actual structure is complete. He, like other craftsmen, has his industrial history and development, the latter of which receives its highest illustration, from the French point of view, at any rate, at the factory of Desfosse & Karth. The fabrication of "painted paper," as the French call it, though belonging by origin to the seventeenth, is, in its existing state, a creation of the nineteenth, century. The idea was conceived, no doubt, at Rouen by François, Lebreton, and others, so far back as A.D. 1680, but the annals of the manufacture really begin with Reveillon, D'Aubert, and Zuber of Rixheim, the last of whom said, in the plainest of language, "This new art is the art of falsification." The first attempt made by François of Rouen was in imitation of high-warped tapestry, then in fashion for the draping of walls. This tapestry had become so fashionable, and was so dear, that the inventor of its semblance speedily made a fortune for himself, preserving for nearly fifty years a monopoly of the manufacture. Curiously-concocted powders sifted through sieves were spread over large and long surfaces, and, falling upon oil, were caught by it, and produced what was then thought to be an artificial velvet. Thence an advance was made towards mimicking on burgher walls the green pastures of Flanders, the hangings of Gobelins, and the carpets of Aubusson. The world accepted this innovation on account of its comparative cheapness, but complained on two grounds,—that the paper thus decorated was not pliant, and that it could only be carried from place to place when rolled on enormous cylinders of wood. Originally, it should be observed, human figures were not attempted,—only marbling, with threads of mimic gold and silver, for the covers of books. Before that time, every ornamentation of paper,—very much resented by the builders and architects of the period,—was a separate act of engraving, and costly in the extreme, the result being obtained by a succession of complicated processes. It was when the production of paper became a great industry that the paperhanger's manufacture became a great industry also. In 1810 there flourished in Paris only one considerable firm devoted to it,—that of Jacquemart, the successor of Reveillon, and its principal productions consisted in paper ornamented with the forms and colours of exotic flowers and shrubs, copied from the Jardin des Plantes,—not very faithful either in shape or tint; but as no competition arose, the profits of the business were large. Yet the competition was forthcoming, nevertheless. A speculator in a small way, at Mâcon, came to Paris, and engaged as his designer a young artist of great and original talent, who combined a certain amount of audacity with grace and elegance in his compositions, while, in addition, he understood how to economise in the purchase of materials. In 1810, what was known as the Greek style prevailed throughout the cities of France, and the capital especially, and false architecture was the rage,—false mantelpieces, moreover, sham curtains, mock frescoes above all. One of these, representing Psyché submitting to the mercy of Juno, was long esteemed as a first-class work of art. Thirteen years later this artist betook himself to the designing of panels as distinguished from rolls; but in 1830, the fashion had entirely changed, the Greek had given way to the Etruscan, the Egyptian to the Saracenic, the Saracenic to the Gothic, and that to the Renaissance, in which all the ancient arts were swallowed up. Further on, the Exhibitions of 1851 and 1855 displayed a wonderful progress, but the specimens were *de luxe* altogether, and scarcely available for the use of the house-decorator at all. Things are in a different condition now, as we find in the factory of the MM. Desfosse & Karth, who are courteous to all strangers, and will allow them to follow the series of processes from the moment when the white paper arrives, to that in which it is distributed, covered with decoration,—flowers, figures, gilding, imitation of tapestry, chintz, marbles, and wood. The qualities are various, from the roughest to the most delicate, priced accordingly, but generally coming from the manufacturers of the Vosges and the Sommes. They are measured in breadths of from a yard to a yard and a half, and in lengths of from eight to thirty yards. Occasionally, however excep-

tional sizes are made, to the customer's order. The colours used are mixed in a paste composed of rabbit, hare, and horse skins, with vegetable dyes added, liquefied lacquer, and Mendar white, which is the base of all the ordinary tints, together with carbonate of lime. Other materials employed are:—Damptain white and carbonate of barytes, dissolved by hydrochloric, and precipitated in sulphuric, acid. This white never turns yellow, under the influence either of time or of atmosphere. But we see, also, in the hands of these peculiar artists, "satin paste," ochres of every shade, yellows, and chromes, perfectly distinct from them, amber-tinted lacquer, grains of Persia, and the peculiar American colour called "yellow oak." Here you have green for a dining-room,—yellow chrome and Prussian blue, they say. This, again, with a slightly different effect, is Scheinfurt green, an admixture of arsenic, and a mingling of that which is recognised by artists as ultramarine. Ultramarine, also, with the aid of Prussian blue, assists in the production of blue drawing-room walls; red dining-room patterns are due either to wood dyes or to cochineal, while antique oak is imitated by the use of bone, German, or Brunswick black. In order to communicate these colours and shades and tints to paper, we observe various processes which are employed; but, in the main, they are either stamped or brushed—that is, in the enormous factory of which notice is now being taken. When stamped, they are usually laid on in three impressions, from blocks of pine and pear-wood successively, elaborately engraved, as though the work in hand were the pattern of an Indian shawl; and a sort of supplementary apparatus is necessary, too minute to allow of description. But, before the paper is either adorned by hand or printed, it is subjected to what is called a "primitive colouring" or "tone," after which, according to the phraseology of the manufacturer, it can the more easily "imbibe" the various colours. One man spreads the "lush"; another brushes it, again and again, along the surface; a third watches to see that it comes to a level; and from this point the distinctions of quality appear. For some, several impressions are necessary; there are "polished," "lustrous," "satin," and "velvet" surfaces,—the last produced by the friction of "Venice stone," reduced to dust,—beyond which we are shown processes of refining and polishing, to produce imitations of marble, agate, wax, ebony, and precious woods innumerable. It is at this point that the manufacture becomes most interesting,—very little machinery can be employed; nearly all the work is hand work; the painters have the air of real artists in studios, although they are simply engaged in copying colours. Their *atelier*, however, is not suggestive of any particular art, with its half-tinted rolls hanging over ropes resembling clothes-lines, its troughs of water, its great oak tables, rollers, palettes, and, as they seem to a stranger, huge array of printing-machines, each alive and bright, however, with colours that shall shine from the walls of the family drawing and dining rooms for, it may be, a generation to come. The paper-printer, like other printers, of course, takes his "proof," sees where the pattern comes out properly, and where it does not, lays on fresh patches of red, blue, or green, where they are needed, and so forth; but, by an ingenious combination, it has been found possible to work off even the most elaborate variegation by simply raising and depressing, in due order, the pieces of the platforms upon which it was laid. Thus, blue came up first; then red; afterwards green; next, perhaps, yellow, without more than an almost automatic shift of the machinery. By another arrangement, two colours can be made to come up together, and to vary their positions according to the complexity of the pattern which is being wrought out. At one time, these patterns were excessively ambitious. From demanding Greek and Roman architecture, the public taste insisted, in paperhanging, upon extensive landscapes, and sea and sky views,—vast horizons, indeed, graduating from azure to orange, and descending thence to pale green and grey. For a long time, as we have said, the process of typography was imitated; but, ultimately, the general taste required more flowing and fantastic outlines,—and a great proportion of the work was simply manual. The vast factory we speak of, however, has brought this industry, as every other industry in Europe has been brought, under the dominion of machinery. The proprietors of this establishment complain that they are compelled to conform with a vitiated public taste. They would prefer to produce large paper panels, in paper frames, representing scenes of pastoral, hunting, or classic life; but they tell us people insist upon grotesque commingling of flowers and fruits, vulgar parodies of popular pictures, and common groups, fit only for the coffee-rooms of hotels. But the MM. Desfosses have not been daunted by these obstacles. They have combined machine with hand work, and reproduced with wonderful effect the outlines sketched by Müller, the paper being thickened, in the first instance, with a perfectly white surface, changing to grey, and then capable, like a prepared canvas, of carrying any variety and complication of colours that is conceivable. In modern days, however, the imitation of wood and marble is the principal object, and to this end planks, scrapers — of copper or leather, — sponges, brushes, and straps, are employed, until the result is obtained, which the manufacturers themselves say is a falsification,—a forgery to the eye, in fact, of stone and marble, of the richest velvets and their pile, of shot-silk even, and of chintz. This last, as fabricated at Rouen, is brought to perfection by means of a preparation composed of linseed oil, white-lead, and other ingredients in the form of litharge, and various mordant dyes, the latest result being, for the ornamentation of rooms, an exact imitation of the Utrecht velvet used for that purpose 200 years ago. Upon the borders of this, gilding, plain or powdered, may be applied at will; but we were informed by the MM. Desfosse & Karth that they preferred the simple products of their own art—for an art it unquestionably is—to any meretricious allurements which might be borrowed from another.

IRON PROMENADE PIERS.

In view of the many promenade piers which now form an almost necessary adjunct of every watering-place which has its own welfare at heart, and wishes to thrive, and of the large viaducts which bridge some of the many estuaries that indent our coasts, and depend for their foundations on iron piles in some form or other, it may be interesting to our readers if we jot down a few practical remarks on the construction of these piers and viaducts.

As all the viaducts and piers we are speaking of have to withstand the attacks of the sea or of fast-running water, it is necessary that they should be so substantial that the waves may beat on them without injury to the structure, or that they shall offer so little resistance to the weight of water that its force may simply pass them by. Piers founded on cast-iron piles aim at accomplishing the latter object, and with reason. Such a structure meets all the requirements necessary: it is far cheaper than the more solid construction, and takes less time in building; it is safe, except under very exceptional circumstances; and from its form it offers very little resistance to the force of the waves, therefore it is not liable to have its deck washed by showers of spray, or even torrents of green sea, as that of a stone pier generally is. The circumstances under which a pier built on cast-iron piles and columns is unsafe are when a vessel drifts from her moorings, or is carried by the force of a storm athwart the pier; then the latter must go, and it is better so than that the ship should be lost, and the crew drowned.

Timber piles, except perhaps when made of greenheart, do not last long when they are alternately wet and dry, though elm piles will remain in good condition for almost any number of years if entirely submerged; timber piles also, from their form, offer more resistance to the waves than a cast-iron pile of equal strength, though smaller dimensions.

There are many systems of foundation piles. We will consider first that which depends on a cast-iron screw attached to the end of [the column for its stability. Engine-power has been applied to the sinking of cast-iron screw piles, but, as far as we know, without satisfactory results. A worm-wheel was keyed with a long feather on to a wrought-iron vertical shaft, flanged at the bottom end, where it was attached by bolts to the pile to be driven; the worm-wheel was rotated through the medium of gearing; the speed, however, could not be made slow enough, and if the least obstruction was met with, the pile ceased to descend, and in all cases it rotated faster than it sank the ground was disturbed, and it was difficult to secure a firm foundation. The usual mode of sinking screw piles is by means of a capstan turned by ropes, working on to crabs driven by hand. The capstan is built up of wrought-iron plates, and has a hole in the centre large enough to pass over the flange of a pile; it is slung at a convenient height by means of ropes or chains attached to the head of the pile. A collar of cast-iron, made in two halves, and fitted with suitable feathers to gear into the capstan, is then slipped into the hole and round the pile, and four steel keys, having sharp cutting edges, are inserted in recesses provided for the purpose in the casting, and are driven up so as to grip the pile. Three keys are better than four, as the pressure on them must be equal; however, practice will ensure that the keys are driven under a nearly equal pressure. Arms of timber are inserted in the capstan, and two ropes are coiled round them, and led to crabs placed at a convenient distance, and worked by hand. These arms are a source of failure, for if they are not braced they are apt to break, and if they are braced they are troublesome to unship. The keys also often cause breakages; if they are not tightly driven they only score the metal; if they are tightly driven they frequently split the pile, especially when the nature of the ground is such that the speed of rotation is uneven, the pile moving by fits and starts. When a top length is being used and is broken it only means so much loss of material; but when it is a foundation pile which is fractured there is the loss of the material, and the pile has also to be withdrawn in most cases, often a matter of time and difficulty. Instead of the arrangement of capstan described above keyed on to the columns, a top length of thicker metal than that used for the piles, say 1½ in., and having two or more strong ribs running vertically along it, may be used with advantage, the capstan having suitable recesses formed in it for receiving the feathers. This special top has also the advantage that it is heavy, and the more weight there is on them the better the screw piles go down; of course, on the other hand, this weight is a disadvantage in handling. Even these special tops are sometimes broken, so great is the strain on them. When boulders are met with, the pile either refuses to sink, or is driven out of the perpendicular, and must be brought back to the vertical position, and to accomplish this it is necessary to provide timber guide piles and walings from which pressure may be brought to bear on the cast-iron piles. In stony ground it is often advantageous to bolt a steel cutter to the lower end of the pile, which either ploughs a way through the stone, or turns it on one side. Cast-iron screw piles are well adapted for foundations where mud is met with, but if the bottom is variable and not soft, some other more suitable form should be employed. These remarks are intended to apply to cast-iron structures only; where the piles and screws are of wrought iron they will bear a considerably greater strain without damage, and the difficulties of attachment of the capstan are not so great; the cost, however, is greater, and wrought iron is more liable to rust in salt water than is cast iron, though, again, it is not so liable to fracture.

Another system applicable to places where the foundation is entirely of sand, is that employed by Mr. Brunlees in the Kent and Leven Viaducts and in Southport Pier, where the foundation piles are cast with a large disc on the lower end. The column is entered into the sand a little, the top is closed, and water is pumped into the interior, forming a quicksand at the bottom, and the pile sinks by its own weight, or such as is added to it. This system also has the advantage that, simply by bolting on another length of column, the pile may be sunk to any required depth; there is also in this plan little difficulty in maintaining the piles in a vertical position.

In cases where gravel, clay, or soft rock is met with, cast-iron piles are often driven just as wooden ones are. The pile may be either pointed, the tip being chilled, or it may be cut off square with a cutting edge. The last form is, we think, the best; for where boulders are met with, the pointed pile is apt to be turned aside, the square-ended one generally goes straight on, displacing the boulder or breaking it, and not being in itself displaced. In clay or gravel the resistance to driving is less, as some of the material passes up the centre of the pile,

and for the same reason the disturbance of the ground is decreased and a better foundation secured. An ordinary pile-engine is used, with a heavy monkey,—say, 35 cwt., and a short lift,—say, 5 ft. It is impossible to specify any exact numbers, they will vary with the nature of the ground and the dimensions of the pile to be driven. The pile must not be struck directly by the monkey; an elm dolley, hooped at the top, and having a cast-iron end below fitting the pile, must be used to receive the shock, and a copper ring is introduced between the pile and the dolley to prevent jarring, or the pile will be split.

In cases where firm rock is met with near the surface, holes may be drilled in it, and a wrought-iron bar with roughened surface extending a couple of feet above the rock introduced and cemented in. A column of suitable dimensions without any flange is placed over it, and the interstices between the column and the bar filled in with cement.

As it is seldom possible to sink the piles to a uniform level, it is usual to cut them off at some convenient height above the surface of the ground, either at one level or in steps; a double-ended thimble is provided rather larger than the pile, and of total length equal to about 1½ times its diameter, having cast in it half-way up three chipping-pieces for resting on the top of the pile and receiving the weight of the column. This thimble is put over the pile, the column is introduced into it; it is then keyed up, and the interstices filled with iron borings and sal-ammoniac. The piles and columns may with advantage be filled up with whatever material is handy; it soon becomes cemented up, and adds to the solidity of the structure.

It is of the utmost importance for the economical construction of a pier or viaduct that everything should be as simple as possible; that the columns should be cast in uniform lengths; and that there should be few, if any, special castings. The bracing should be simple in form, not liable to be entangled with wreckage, easily attached to the columns, and not difficult to adjust for length, as the position of the piles is seldom exact, and their level is decided by circumstances.

One of the first considerations should be the height of the deck, which should be well above the water; a very small blow from a wave will shift it, and, perhaps, endanger the whole structure. The level of the deck ought to be particularly considered at the abutments if it is subject to the wash of the waves, as, forming a solid barrier to their progress, they rise higher here than elsewhere.

Where it is intended that vessels should come alongside the pier, the head to which they approach should be made of timber; that is to say, the piles and bracing should be of timber, the superstructure may be of iron. If cast iron is used for the piles they are liable to be broken by the repeated shocks of vessels. The timber head should be entirely free from the rest of the structure, so that it may move without damage to the pier proper. Greenheart should be used for the piles at any rate, as all other sorts of timber are liable to rot when alternately wet and dry, and are subject to the attacks of worms, which destroy them in a wonderfully short space of time when they have once got into them.

For the superstructure of the pier it is best to use lattice girders; they are easily handled, and offer less surface to the wind, and they have a lighter appearance than plate girders and are more in keeping with the rest of the structure. Whatever form is used, it should be kept well above the surface of the waves.

For the deck, pitch-pine planking laid diagonally is satisfactory; the planks should not be laid longitudinally, as they wear unevenly. If the planking is laid close, the deck should have a camber for drainage; if open, this does not matter.

It may be here remarked that it is as easy to make a pier of this description sightly as unsightly, and there is no reason why the one should cost more than the other; all that is required is that every care should be taken that the design is complete but simple, that the knowledge of ironwork employed should be thorough, and that there should be no patching. Ornament should be excluded from the pier proper; its appearance should depend on the neatness, simplicity, and elegance of the design, not on elaborate castings. If ornament is required, it may be introduced in the entrance and deck-houses.

SOME ABUSES IN HOUSE FURNITURE MANUFACTURE.

A CRAFT was anciently a "mystery" or art, the user of which was a member of a guild that regulated its practice. The cabinet, chair, sofa, and bedstead maker, and other kindred workers in wood, were classed for guild purposes under the term of "joiners" in contradistinction to the older term of "carpenters," which is still understood in the British Islands to include that of joiners as a general name for woodworkers in house-building. The word "cabinet-maker," though accepted for a couple of centuries or more as an expressive denomination for those craftsmen engaged in making furniture, still is nowise expressive, strictly speaking, under the modern conditions and organisation of the furniture-making trades. Like many other trades during our time, cabinet-making, taking it in its widest sense, has been split up into a number of subdivisions or branches. Indeed, we might say with truth that a cabinet-maker, as the trade is now practised in London, is a craftsman who works ofttimes the whole year round in executing but one class of work. Some men are continually kept to turning out sideboards, some to secretaires, others to round tables and chests of drawers respectively. In fact, workmen from their own choice, and having acquired a speciality in making a certain article of furniture, continue mostly at making that single article so long as their employers can give an order for it, or there is a demand in the market for it. Half a century ago, in many of our cities and towns in the British Islands, cabinet-makers to a pretty large extent worked by the day-work system; but, in London and other large cities and towns for many years back, the piece-work system is almost universal in the cabinet, chair, and sofa making trades. The writer has a pretty long experience of the ways of the trade or trades under notice in different parts of the British Islands, and he is compelled to say, in a general way, that as far as skilled execution and good work are concerned, the cabinet-making trade has gone rapidly from bad to worse during the last thirty years. Were the "mysteries" of the cabinet trade, as now carried on in London, unfolded in all its details to the general public, it would, we have no doubt, create not a little surprise. Food manufacture has of late years been subjected to considerable analysis, but furniture manufacture goes "scot" free, although there is a considerable amount of fraud and positive danger connected with the latter, as well as the former. Since the advent of City and Metropolitan Improvements, a great exodus of the workmen engaged in the various departments of the cabinet trade has taken place, and is still proceeding. This migration is more observable in East London than at the West End, for the great centre for several years of the cabinet trade has been Curtain-road, Shoreditch, a portion of the E.C. district. Particularly during the last ten or twelve years the chamber workmen, and the small chamber masters, who once had small workshops in their own houses and back yards, in the courts and alleys of the east of the city, have been driven suburbs-wise, or afield, and many hundreds of these will at the present moment be found in back streets, courts, and alleys, extending eastward from Curtain-road to Stratford on the one side, and to Islington, Tottenham, and to Walthamstow, beyond the river Lea, on the other. The districts of Hackney, Bethnal-green, and Hackney-wick (on the borders of the Marshes) contain a large number of working cabinet, chair, sofa, and looking-glass frame-makers, as well as makers of various other articles of household furniture. The City, West End, and Curtain-road warehouses are principally supplied by the labour of East London workmen working for themselves, or working for small masters who find a market for their goods in Curtain-road, but who prefer to find it in other warehouses where they are better paid. Before recent Metropolitan Board demolition and improvement schemes were carried out in the Curtain-road district, the locality in question was regularly matted with furniture-makers of all kinds. Long lines of large warehouses and workshops, and side streets and alleys, were almost choked to repletion with workmen in their small rooms, busily engaged from morning until late at night executing some one piece of furniture or another to order, or on "spec." From causes already indicated, there are now fewer large furniture warehouses in Curtain-road. Some of the large firms have removed to adjacent streets, and the chamber masters and numerous hosts of home workmen are driven afield. It is a patent and undeniable fact that of furniture now thrown into the British market, both that which is sold at home and exported, is to a very large extent of the most inferior description. It may be taken for granted that with the advent of low speculative house-building in London several years ago, cropped up the desire for cheap furniture. With bad house manufacture soon followed cheap and bad furniture. The one evil led to the other, and as houses were built to sell and not to last, so was, and is at present, the major part of our house furniture. We found by numerous inquiries, and an intercourse during some months back with some respectable members of the cabinet trade, that they are fully alive to the abuses in connexion with the trade, but they say they are obliged to go with the tide, and they are powerless to effect a reform. They know that tables, chairs, sofas, &c., of the flimsiest kind are now manufactured, and that these articles if put into constant use will walk asunder in a few weeks or at most months. Not only is the scantling used of the thinnest description, but it is often most unsound, particularly where the work is veneered. Table tops, and the tops and broad planes of other articles of furniture, are by well-known expedients made to carry the thickness or solidity of honest, substantial, and durable work. The fact is, however, that thin leaves of the most common description of deal are not only veneered, but their front and side edges are made to assume a solidity which they do not possess, by planting upon them, or rather under them, rounds and hollows or ovolos and astragals, or a combination of other mouldings. There can be no reasonable objection to good veneered work, for a solid mahogany table, sideboard, nest of drawers, &c., would be expensive to the general run of purchasers, and entirely beyond the means of many others. But a half-inch deal leaf (veneered) should not be imposed upon purchasers as work of an inch in thickness, or, in other words, the thirty-second part of an inch in mahogany on a half-inch deal ground. The mahogany or other veneers now used are knife-cut instead of sawn, and the former will soon be universally used. The small masters and workmen were for a long time disinclined to use the knife-cut veneer. The sawn veneer is the more solid, and takes the staining and French polish better than the knife-cut material, which soon absorbs the polish, and does not so well maintain the body or gloss that the sawn veneer holds. It is a rather deplorable fact that cabinet workmen earn more wages at present by making cheap and flimsy articles in the furniture line than solid or elaborately-finished articles. As it is with the workmen, so it is with the small employers; they also make more profit out of cheap furniture than good. Novelty in design, though the articles may be poor in material, and flimsy in construction or framing, will often sell well for a few seasons, until some other flimsy novelty in cheap furniture supersedes it. Curtain-road warehouses of late years have got a bad name, though side by side with a large mass of the most trashy kind of furniture you will find in the same warehouse some excellent work. The demand, however, for good cabinet-work (which is dear) is not very brisk; while, on the other hand, for cheap drawing and sitting room suites there is a constant demand. We have heard some working cabinet and chair makers speak strongly against the warehousemen of Curtain-road as skinflints, who grind down small masters and workmen engaged in making furniture to starvation prices. Indeed, among some classes of small furniture-makers in East London, Curtain-road is known as "the Slaughter-house." To what extent the term may be justified we are unable to say, but we think it only right to register the words, that an opportunity may be afforded to both sides, either in corroboration or denial. This much, however, we do know, that very poor prices are paid by several of the warehouses in Curtain-road and adjacent localities to working cabinet-makers and small manufacturers for the articles made to order for them, and much smaller prices still for those articles which the small manufacturers or working masters are obliged to sell when finished, having made them up on "spec."

From what we have above stated it may be inferred that there is at present in the London cabinet and chair trades an abuse somewhat

akin to that known in the tailoring trade as the "sweating system." Men and boys, or youths, are obliged to work long hours in the making of several articles of furniture to earn sufficient wages to live. Many unscrupulous furniture sellers or brokers get a hold of youths at the cabinet trade who have not much experience. They will show these youngsters a piece of new furniture (perhaps a new design); they will offer them a price, and, as an inducement, will tell them in an off-hand manner, they will give them an order for a half-dozen or a dozen of the articles in question. The raw youths, who never made the articles before, on being tempted with an order, clutch at it often, but soon to their grief find before they have executed a third of their work that they have been completely "sold." The price offered involves long hours, hard work, and little or nothing for their labour. The furniture man, who has calculated his chances beforehand, and has left himself a wide margin, can afford to increase his price, which he is often obliged to do for his own safety, that the work may be finished, which it mostly is to the great profit of the furniture seller, and the sore loss and disappointment of the young workman.

A very large amount of the furniture now turned out in the metropolis, though made for use, is only fitted for mere show or ornament. The chairs and sofas mostly to be found in the houses of our middle classes and in the homes of respectable artisans and clerks are a fraud and a calamity. Where mortises and tenons should be found there are nothing but single dowels or pins of wood, and where dovetails should exist there are nails or screws. Cabinet and chair makers of late years have taken to "scamp" their work in the most barefaced manner. Screws are used to fasten on the top rails of chairs where hidden dovetails were formerly used, but to hide this slip-shod and reprehensible work the heads of the screws are sunk, and projecting buttons of wood inserted. Mahogany and oak work is often treated in this manner, a practice which would not have been tolerated some years ago. In the manufacture of chairs in white wood, or of cane-bottomed chairs, the framework of the seat is often halved into the backs instead of mortised and tenoned, and screws, sunk and covered, are made to hold the whole together. This and kindred work, in the furniture-making line, which we might describe in detail, is veritable "Jerry" furniture manufacture.

We have talked with cabinet and chair makers who declaimed loudly against the wretched "Jerry" houses they were obliged to live in, and they considered no terms were too severe to use in denunciation of carpenters, bricklayers, and speculative builders. Had these masters and workmen, however, seen themselves as others have seen them, they would have to acknowledge they were contributing largely to the perpetration of that evil in their own trade which they so strongly denounced in another.

In connexion with chairs and sofas of the class we have been describing, the upholstery is wretchedly bad,—merely done up for the eye. Any stuffing, save good horsehair, or curled hair, is pressed into service,—pig-hair, hay, alva marina, flock, straw, finely-cut shavings,—anything but honest material. Canvas and web are, of course, used as of old, but of cheaper description; and the inevitable weak springs, to afford a temporary elasticity for a few weeks. Constant use soon brings on the dreaded calamity; the cheap American leather, or highly extolled inferior rep covering, cracks and tears asunder, and exposes the stuffing, and the seat sinks as flat as a British pancake.

Any young cabinet workman or student interested in the history, progress, and manufacture of durable, beautiful, and elaborately-finished chairs and cabinet work, should pay a visit to the South Kensington Museum, and its adjunct, the East London Museum. In both of these places he will see specimens of cabinet work of the sixteenth, seventeenth, eighteenth, and the earlier part of the present century worthy of admiration and deep scrutiny. Of plain and massive work, and of highly complex and ornamental work too, he will find several exquisite examples. Good veneering, grand inlaying, rich marquetry, &c., are in both museums, the work of native cabinet-makers as well as foreigners. The East London cabinet-makers and their present-day employers will learn much by a few hours' study and careful observation in Bethnal-green Museum; for there will be found some fine specimens of the works of Chippendale, Sheraton, Heppelwaite, and others, some of them practical cabinet and chair makers as well as designers, and authors of excellent treatises upon their respective crafts. Unless to order, for some wealthy person, furniture such as the above historic cabinet-makers designed is not manufactured for the market in these days. To make such furniture now would not, unfortunately, pay; the workman would not earn subsistence wages upon it; and the employer would be likely to have it a long time upon his hands before he found a purchaser. It is only under special order, or as a labour of love, not depending on ordinary trade conditions, that the elaborate and substantial cabinet and chair work produced in the last century is possible now. Still there is no reason why good and durable cabinet and chair work at fair prices should not be turned out at present in London. The why it is not turned out is from reasons already stated, and other additional causes easily guessed. We will not enter into further details at present, reserving for another occasion some further under-glimpses of the art or arts of furniture manufacture. In this journal for years, close as has been its affinity to the art of building, it has never ceased to denounce the abuses in connexion with its practice. House-furniture manufacture and house decoration are closely allied with the profession of the architect and the arts we advocate, and we are quite within our province in what we have written. As we have not heretofore spared bad builders, we are not likely to halt short in meting out to furniture-makers the share of blame that legally attaches to them and others in a system that is working much scandal and injury in connexion with their art, our art, and the homes of the people. In a word, house-building reform, to be complete, must include house-furniture reform; and if those upon whom the latter duty devolves are not equal to the occasion, the architect may soon perforce, for his own credit sake, have to lead the way.

INTERIOR ECONOMY OF THE OFFICE.

The two minor rules of office economy yet remaining for discussion,* bearing as they do on financial matters, are certainly not the least in point of importance, and yet it is not at all an uncommon occurrence to find the architect or engineer treat such matters with very great indifference. "Accounts will keep," one will say, as he turns to some professional and far more interesting work. "My clients press, and I must attend to their interests before my own," another will urge, and so on. Indifference of this sort is much to be condemned, for as no man would think of trying to complete a long journey by road without, at the proper stages, pulling up and baiting his horse, and looking to his harness (and this, too, however eager he may be to get to his journey's end), so should no man attempt to go through his professional career in life without halting at proper stages, and attending to financial matters, despite the claims or clamours of clients, or the self-absorbing nature of his work. Thus, and thus only, can he, like the freshened horse, hope to do justice to himself and to his employers at large; for the man who knows his accounts are muddled and in arrears can never bring the same clear intelligence and unclouded spirit to aid him in his work as can he who, by the exercise of a little forethought and careful arrangement, has his books posted up and accounts in order.

Apart from these considerations, also, want of method and regularity in keeping accounts must result in unmethodical and irregular charges to clients,—too little to one, too much to another, with probably the corresponding results of little or no thanks, and much, and not unnatural, grumbling.

An architect or engineer maintains, say, some half a dozen *employés* of different calibres, from the juvenile, indifferent and idle when he can be, clerk, to the tried, trusted, and hardworking senior assistant; and we take it his duty is so to arrange matters that these *employés* are, during the whole of office hours, fairly and honestly engaged in the separate duties assigned them, and that their time, with a due percentage added for supervision, instruction, rent of office, use of materials, wear and tear of instruments, &c., is fairly and honestly booked, at the close of the day, to the proper clients. To insure fair and honest work on the part of the *employés* will necessitate the unremitting care and attention of the head or heads of the office, while fair and honest booking of time may be managed as follows:—

At the commencement of the year an ordinary shilling diary is served out to each *employé*, which, labelled with his name and a distinctive number, is ordinarily kept in a similarly numbered pigeon-hole of the diary-rack or shelf, fixed in the principal or most generally-used room of the office. Prior to quitting office for the day, each *employé*, readily finding his diary by its number, should record the name of the client for whom he has been working, the subject itself, his expenses if any, and the time expended; and for which last purpose an office day need hardly be divided into less than quarters, it being obvious that smaller divisions would be too troublesome and tedious for general adoption.

The sixth and last of the minor rules may be briefly summed up in the two words "double entry"; and it will hardly be too much to say that where the architect's or engineer's accounts are not kept by this method, loss and injustice to both self and clients must ensue.

A dissertation on the merits of "double entry" would be somewhat beyond our province. Those who use the system know full well its advantages; and those who do not use it must be persuaded by other words than ours.

It will be our endeavour merely to point out a convenient method of entering the accounts in the "journal," so as to be ready for posting in the "ledger."

The bases or foundations for building the journal upon may be said to consist of four, viz., the cash-book, the cheque-book, the telegraph-form book, and the abstract-of-work book. The two former need no comment or explanation save that it will be found very advantageous to have the cash-book ruled with double columns for cash, while the telegraph-form book is merely the book now issued by the post-office authorities. The "abstract of work" book is the abstract of all the diaries for any one month, and is made up as follows:—A half-sheet of foolscap being taken, it is divided by folding and refolding into four equal divisions or columns standing perpendicular to the long side or edge of the paper, and by another fold or crease, the second column from the left hand is also subdivided into two columns of unequal width, the narrower being to the left.

A longitudinal fold of the paper marks off, also, a convenient margin for the following headings to each of the five columns:—"Date," "Number of Days," "Client," "Subject and Details," "Charges."

To each *employé* a half-sheet of the above description is devoted, with his name, also the month and year, being inscribed in the right-hand top corner, and the monthly record of his time (as abstracted from the diary) inserted as follows:—Running through the diary the different clients' names are picked out and inserted in the proper column, and then, in the "Date" column, opposite each respective client's name, are placed the days employed in his service, each day being designated by its numerical monthly number, annexing, where parts of the day only have been taken up, their proper fraction. On completion of the "Date" column, the total number of days given to each client is inserted in the "Number of Days" column, which should amount, if no mistake has been made, and it is, say, the month of September, to a grand total of thirty.

In order to account for every day in the month, several "dead horses" will have to be worked in the client column, *e.g.* "Sundays and holidays," "office," "sick-list," &c., and opposite which, in the "Charges" column, unfortunately no entry can appear.

The column for "Subject and Details" can be readily filled up as the "Date" column is being proceeded with; while, last of all, comes that set aside for "charges," these depending on the particular *employés'* work, increased by the percentage due for superintendence, cost of office, &c., before alluded to.

The total of the "charges" column will give *employés'* earnings during the month, and the grand total of all the half-sheets, now pinned together, and forming the "Abstract of Work" book, the professional earnings during this period, which should, of course, correspond exactly with the amount shown on the credit side of the professional account as set forth in the ledger.

It may be objected to the above scheme that there are so many cases where "commission"

* See pp. 930, 1009, *ante*.

is received by the architect or engineer, irrespective of the time expended on any particular work, but all time should duly appear in the professional man's books, whether he is to be paid by commission or otherwise; for thus, and thus only, can he tell what the value of each *employé* has been to him during any particular period, whether he gains or loses by the commission received; whether, gauged by the usual commissions, his time-charges are too high or too low, &c.; while all differences between amounts charged to clients as commission, with the actual amounts set forth against them in his books, can easily be reconciled by means of the "profit and loss" account.

Time being fixed as the basis of the financial part of the business, it behoves the architect or engineer at the head of an office to ever keep in view the serious responsibility that rests with him in insuring, as far as lies in his power, that his *employés* not only work well and diligently during office-hours, but also duly and properly record such work in their respective diaries, and to the attainment of these ends he must bring to bear the force of precept and example, and, if necessary, a strong hand.

The architect or engineer, like the skilful and judicious "whip," must endeavour to handle his team of *employés* to the mutual advantage of his clients and himself, while those subordinate to him must learn to recognise that their own comfort and welfare depend on the professional success of their employer, and therefore that it is their part to willingly aid him in carrying out all his plans and wishes as far as lies in their power. Subordinates must bear in mind, too, that while pursuing the even tenour of their way, and enjoying the blessings of regular hours, regular pay, and the absence of all professional anxiety, the head of the office has a far more thorny path to travel, when disappointments, bad debts, troublesome and exacting clients, and anxieties they know not of, meet him at every turn, and that on the whole they are perhaps as well off, perhaps far better, than their employer.

In conclusion, while venturing to express a hope that the system of interior economy now advocated may be found useful (it certainly is practicable) to many of our readers, we must again remind them that interior economy, whether practised after this fashion or after that, is but a means to an end,—a means whereby, while the scope of intellectual power is extended, and greater time afforded for the pursuit of professional knowledge and the study of art in its various forms, every professional man, be he architect, engineer, or surveyor, is enabled, in his generation, to do the greater good.

LEEDS.

A MAXIM of old Fuller must have been well learned by Leeds, that "Haste and rashness are storms and tempests, breaking and wrecking business, but nimbleness is a full, fair wind blowing it with speed to the haven." Leeds is old, it has long been commercially famous, and it has gathered not only a large but a varied trade, so that it does not feel either the feverish impulses of anxious demand or the corresponding depressions which the whirligig of time invariably brings in the train of the first. It owes its growth to its position, to the seizing of the advantages naturally given to it, and to the increasing of these as well as the development and perfection of chains of communication, and these have brought about a steadiness in the rate of its advancement. Into the olden story told of Leeds we need not now inquire. Taking it as a patent fact of great magnitude more than two score years ago, let us contrast its state then and now,—when the Hunslet suspension-bridge over the Aire had just been erected; when the old "Oil-Gas Company" had just been wound up, and out of its ashes the phœnix of coal-gas was arising; when the echoes were dying away of the first election, at which John Marshall, junior, and Thomas Babington Macaulay were elected with 2,000 votes, as the highest number polled; the new baths were being opened, and before railway communication had extended to the town, it was even then a place of magnitude. It was the principal seat of the woollen manufacture; it made "broad and coarse narrow cloths, pelisse cloths, shawls in great variety, stuffs, Scotch camblets," &c. It spun flax for canvas, made cotton and silk, glass and pottery, dug coal near, and had even then notable foundries. It had thirty-two places of worship, and three weekly "respectable and talented journals," two of which have taken the new departure into daily journalism since that date. Dull reading is an old directory, but those who know the changes of two score years will find it suggestive to revert to the days when the seven banks of Leeds included those of Beckett, Blayds, & Co.," of Bywater, Charlesworth, & Co., and of J. & W. Perfect & Co.; when brickmakers had their fields in Meadow-lane and Headingley; when there were only two consuls; when Kirkstall forge was in the hands of Beecroft, Butler, & Co., and Hird, Dawson, & Hardy hailed from Low Moor. These were the days when the names of Joseph, Josiah, and Newman Cash, of Aldam, Pearse, and Birchall, of Luccock, of Stansfield, and others,—were well known amongst the stuff manufacturers and merchants; and the Jowitts, Wades, and Whiteheads were amongst the magnates of the woolstaplers in Albion-street, Call and Boar-lanes. Conveyance by water bore then no small part of the productions of the town away, and "fly-boats," and Hawkswell's & Stancliffe's vessels were well known on canal and coast and in the Aire and Calder Dock. In those days, when the "town and liberty" had a population of 123,393, it had even then a public spirit beyond many a larger town, and to this its noble infirmary, its dispensary, "fever house," and lying-in hospital bore ample testimony, as did in other directions its philosophic and literary society, its early mechanics' institute, its two museums, its many libraries, and its cloth-halls. Its trade was vast, the then recently-published annals accrediting it with the possession in its manufactories of 228 steam-engines, of some 4,048 horse-power, and then estimated to need 157,870 tons of coals for fuel for steam-raising purposes yearly.

There has been full growth in the years between then and now, and at the present it may be said that Leeds is numerically and commercially great, and that there are all the tokens of a vast and a growing population, and that the trade on which it subsists also shows signs of continued vitality. It is in that great South Yorkshire coalfield which enriches with its mineral output so many towns, and which gives in the mineral statistics to the Leeds district a claim to the possession of no less than 141 collieries. It is in the Yorkshire iron district,—not the great Cleveland district, which has sprung up with mushroom rapidity, but the old and early-famed West Riding one, to which it contributes three sets of smelting-works, not the least noted or least productive. It has eight sets of finishing ironworks—the capacity of production of which will be indicated to the technical reader when it is stated that they have in connexion with them 157 puddling-furnaces and about thirty-six mills. In addition to these, there are works in which the product of the ironworks is wrought into articles for which Leeds is noted, and there are the various establishments of the railway companies for the repair of the rolling stock. One of the chief of these,—that belonging to the North-Eastern Railway,—though only serving some of the smaller branches of that company's lines, occupies over six acres of ground, and employs nearly a thousand workmen. Nor is the steel trade wholly unexistent in the district, for in the list of firms employing the Siemens Regenerative Gas Furnace is included the Monkbridge Iron Company, Leeds, which has seventy-two crucibles for which furnaces have been built. At the same time, seeing that, on the one hand, Leeds is not a large consumer of steel for purposes of manufacture, and that, on the other, its distance from the coast and from rivers navigable for large vessels, it is placed under some disadvantage in this respect, and its steel industries are not likely to be developed to any very great extent, but unquestionably its eminence in other trades renders it needless to endeavour to reach greatness in a manufacture it has not great advantages for. In the manufacture of paper, for instance, it has some fame, and the half-dozen mills it owns include some known for the "browns and glazed browns," as well as the grocery and other kinds of paper they make. It believes that there is nothing like leather, and some years ago was believed to employ close upon 2,000 persons in the leather trades, and a considerable number in the manufacture of boots and shoes,—of which it then turned out 60,000 pairs monthly. Tobacco is made to the extent, as given in the report to which reference has been made, of 46,000 lb. weekly; glass in comparatively large quantities is made, as well as earthenware. The chemical trades prospered for a time, employing some 500 persons, as well as the oil trade, though the latter was not a large contributor to the labour market; but there has not been the growth to the full extent in this industry that there has been in some others of recent years. In the great textile trades which are the staple of Leeds, the most reliable figures are those laid before the British Association on its visit to Leeds some years ago, when it was stated that there were 128 firms engaged in the woollen manufacture, having in use a nominal horse-power of 2,924, and employing 10,193 persons. In the worsted trade it was believed that some 10,000 spindles were employed; whilst silk and flax contribute largely, though in a minor degree, to the prosperity of the town, as does dyeing, toolmaking, &c. The horse-power of its engines, and the consumption of fuel for steam-generating purposes, are more than double what they were at the date for which they have been given, and it is at least probable that the consumption of coal in the borough proper is now above 1,000,000 tons yearly.

In fact, the trade of Leeds has known an almost continuous growth since the days when Thoresby declared its "famous cloth market" to be the "life, not of the town alone, but of these parts of England." The manufacturers of the whole of the clothing district along both banks of the Aire for a dozen miles make the great cloth-halls of Leeds their market, and thus Leeds gathers in not only its own manufactures for sale, but those also of the numerous manufacturing villages and towns studding that immense district. Uncounted millions are yearly paid for goods sold in these halls; and a very large proportion is distributed in the shape of wages in these communities, whilst the Pactolian stream is added to by that paid for other industrial productions. The growth of these vast industries has caused a corresponding growth in all the tokens of population, of citizenship, and of associated effort, and now the townsmen of Leeds may boast that they are citizens of no mean city. Leeds has grown with the growth of its trades, nor has its public spirit lagged behind; and thus, in its public buildings, in its associations, and in some of its surroundings, it is now fairly entitled to take no undignified place in the roll of British cities. It is not free from the evils which are usually known in large towns, as the fact that one out of 164 of its population is annually taken up for drunkenness, and the allied one that it has a house licensed for the sale of drink to every 316 of its people jointly testify. It has "one of the most successful reformatories," having between one and two hundred inmates; the total of the indoor poor is 1,260, and that of the outdoor over 3,700, so that it has "the poor always with" it. At one of its public dispensaries the weekly total of persons treated musters up to about 1,400. But whilst there are these and other similar signs of depravity and disease, there are those which fully testify to the attempts that are being made to cope with them by educational, philanthropic, and religious effort. Already an admirable work has been done by the School Board, in the provision of accommodation and in the compelling of the use of that accommodation; and other less known organisations have done their full share of the work of education. Few towns have had more philanthropists than has Leeds, and there are abundant results to be found from their labours—results to be placed in the most unsatisfactory medium for inspection, tabulation—if need be. Too recently to need recapitulation a statement was made as to a part of the work of the Established Church in Leeds, and dissent in its many phases has not been a whit behind.

Of the future of the town much need not be said. The extent and the variety of its trades, its dependence upon so varied and so numerous supports, the full facilities for traffic and transit it has, and the public spirit of its citizens, all combine to give ground for the belief that, progressive as has been its past, its future will not be the less so. The tokens that capital gives of its appreciation are there; and the returns of the investment of that capital in bank and company, railway and tramway, are good. There are no flies in this pot of golden ointment, for the depression in the trade of the country, though marked in Leeds, was not marked so fully as in centres where there is dependency upon one branch of trade, the mineral trades

especially. These, so far as known in Leeds, were affected there, as were in a minor degree other trades. With its trade on these varied bases, with extension in one or more continually going on, and with improvements of various kinds ever mooted and carried out, the town should have a high commercial future. The old unhealthy state it knew forty years ago it knows no longer: the provision of cemeteries and of sewerage systems, and the "opening out" of some of the rookeries it then held, have since done much, with the provision of "town's lungs," to improve the condition of its peoples. It is not as yet a model town in these or other respects; but the irrevocable past is not wasted, for, "rising on its wrecks," the town aims ever at something nobler and higher. It has yet much to do, but looking back at what it has done, it may take heart and go forward in that path which towns must take if they would not by being themselves stationary be retrogades in the race of communities.

A GERMAN RAILWAY STATION.

It is a gloomy prospect which Mr. Ruskin holds out for the lover of the picturesque in the future, if it really is to be the case that "instead of cathedrals, castles, or abbeys, the hotel, the restaurant, the station, and the manufactory must in days to come be the objects of England's artists' worship." Seriously true as may be this sad prophecy, the enthusiast who, sketch-book in hand, finds himself in the venerable town of Neuss, on the Rhine, will centuries hence, find a railway-station when in ruins not unworthy his pencil.

Even were the town to suffer as much as it has done within the last century, and were all vestiges of the antique Neuss (which was a flourishing Roman colony at the time that Pompeii was a fashionable watering-place) to pass away, still will remain the stately pile of the recently-completed railway-station.

This building, in the style of the German Renaissance, exhibits most of the salient peculiarities of the sixteenth century. Pretentious in its appearance exteriorly and interiorly, pretentious in its apparent regard of detail, it is somewhat amusing to read the equally pretentious way in which the local newspaper speaks of this wonder, which, commenced three years ago, has recently been thrown open to the public.

The façade of the stately edifice (whose photograph may be seen in every stationer's shop throughout the town) has certainly been the result of labour, the architect, however, having, within a day's journey, many perfect examples to study. The same may be said of all the interior arrangements; though, as one enters, and turns to the ticket and luggage offices, whose announcements are carefully painted in black-letter, it is somewhat difficult to realise, notwithstanding the carved and tinted pillars, and other necessary accessories, "the hypocritically devout mood" of the local editor, in surveying "this quiet alley which so closely resembles a cloister."

This "cloister," the glass in whose doors is carefully guarded by much tortured and painted wrought-iron work, leads to the waiting-rooms, one for the third and fourth class passengers (for here in Germany a certain famous bishop would be able to fulfil his desire); the other for the first and second class passengers. In each of these rooms the style of the Renaissance exterior is "rigorously" kept up in the oaken tables and settees, the strong seats, the raftered ceiling and rondelled windows; and already, perhaps, more than one modest traveller has "entertained a doubt whether he were worthy to sit down in one of the antique oaken seats with their high backs." Once seated, however, "the calm feeling which makes itself felt in the austerity and correctness of the room would afford him a striking proof of the impression which remembrances of the long bygone past are able to produce when architecturally embodied."

But the chief efforts of the architect have been directed to the principal waiting-room, all the details of which have received (at a first glance) a studious attention. A well-arranged half-light, which streams in through the stained-glass windows, shows us the walls carefully covered to a third of their height with well-imitated stamped leather, while the ceiling, professedly of carved oak, is painfully decorated with variously-coloured patterns. Round the room run quaintly-lettered inscriptions recording the commencement of the building and its completion, while the lamps are avowedly counterparts of examples which once existed in the Carmelite Church at Düsseldorf.

Special pains have been paid to the (however unsatisfactory) stained glass, the escutcheons on the principal window showing the arms of Cologne and Neuss, as also those of the patron saints of the two churches. At each side of this chief window are smaller casements, decorated with inscriptions appropriate to the place, recalling to the traveller the fact of his transitory visit to the spot, and urging him to make good use of his time, as also of his eyes, for the good of his country. The carved buffet, another effort of revival of the German Renaissance, is also decorated with appropriate inscriptions.

But it is the ladies' *salon* which is the most satisfactory effort, probably, of the whole. In this room, separated from the principal room by hanging curtains, the usual-patterned velvet chairs and sofas have been banished, to be replaced by (still more inappropriate) lounges, while the light coming through the not however too-carefully-planned rondelled windows, allows the fair travellers to admire themselves in imitation Venetian mirrors. Surely the architect was somewhat of a cynic, for under each of these is carved, in undying letters, the two following cruel mottoes:—

"Each object has two sides,
I only show you one—of both.
I paint for you your face's features,
As you appear to me—not otherwise."

It will be seen that no inconsiderable effort has been made in the building of the Neuss Railway Station, and an initiative given which is sadly wanted in Germany, where the railway stations, in common with all the modern architecture of the country, call for great improvement.

In the present day we are accustomed to see in the houses designed by some of our successful professional men, many satisfactory revivals of past times; as yet, however, the initiative of restoring some picturesqueness to our railway stations has to be more universally followed. The only pity lies in the fact that when such revivals are made, even greater care is not bestowed on them than at the present the architect is willing or able to give.

That in the town of Neuss, in the country of Albert Dürer's Nuremberg, and a few miles only from Cologne, a more perfect specimen of work should not have been produced, when so much time and expense have been ungrudgingly bestowed, is strange.

For Neuss is a town worthy the study of the architect as well as of the painter. Apart from the stately church (a venerable remnant of antiquity, familiar to all students, but alas! ruthlessly restored),—surmounted by the bronze statue of the holy knight St. Quirinus, which has alone escaped destruction by the happy state of the matrimonial market,*—and the Roman gate of Drusus, which saw the fifty-six assaults of Charles the Bold's Burgundian army in the fifteenth century, there exist many quaint old-world specimens of architecture of a period which, at the present especially, very many of us admire.

Only a few steps from the railway station, in the ancient Niederstrasse, there stands the old crow-step-gabled inn of the Black Horse, over whose narrow and sculptured doorway is the carved and painted sign,—"Zum Schwarzem Ross, anno 1603." It is a characteristic hostelry, which, however, modern times have sadly altered; still, the old lustred glass remains in the windows, on whose sills stand quaint pots of flowers; still in the back room, with its carved oak rafters and dainty cupboards, there is a true smack of the past.

But more attractive is another inn not many yards from the Rathhaus, a signless inn (not quite so celebrated as the *Three Moors* at Augsburg and its world-famed cellar), whose well-kept stained windows (with their strong stone mullions) light up a large open room to the street; on one side the entrance of the cellar yawns, and on the other, the stairs lead to the upper stories by a gallery opening on the principal room, and where, in a dark corner, may still be seen burning, as it has burnt for many a generation, the Madonna lamp.

* A local legend tells us how each year the statue of the saint ought to be scrubbed bright by the old maids of the town. It will be remembered how the authorities of Rotterdam had to forbid the cleanly housewives of that famous city from polishing the statue of their beloved Erasmus.

Though Neuss is to the visitor but a somewhat deadly-lively provincial town, in its government it has an energy one would little expect to find, and within the last few days has been unveiled, under the shadow of the antique cathedral, a costly monument to those townsmen who fell in the great wars of 1866 and 1870-71, which have made Germany what she is, and what she is now beginning to deplore. A work of no mean pretensions, this monument is one of many hundreds which within the last few years have risen in almost every large town throughout France and Germany.

It was in the autumn of 1875 that we had the opportunity of seeing a like monument (but sadly inferior to that of Neuss) erected at Bazeilles, a village for ever famous in the pages of history as the scene of the great battle of Sedan, and in the world of art as the scene of perhaps the finest of the numerous battle-pictures which the Franco-Prussian war originated, the *Dernières Cartouches* of Alfred de Neuville.

Should the sketcher of the future, a kinsman of Macaulay's more fortunate New Zealander, go to Bazeilles, he will probably have but little need of his pocket-book and pencil, for by then the ruins of the unfortunate village will have been restored, but when in the further course of his rambles he will penetrate to the then more than venerable city of Neuss, he will probably be able, with thorough satisfaction, to sit down before the War Monument in the Cathedral Close, if not before the by then weather-beaten remains of the Neuss railway station.

Düsseldorf.

ELY: KING'S SCHOOL.

Important works are in contemplation, under a scheme of the Charity Commissioners, for providing increased accommodation for the school founded by Henry VIII., and attached to the Cathedral at the dissolution of the Monastery, 1541. The school is at present located in the ancient gateway (known as "Ely Porta"), built by Prior John Burton about 1380, and in certain other buildings both ancient and modern on the east side of the street known as "The Gallery" leading from Ely Porta to the Galilee.

A new hostel for sixty boys is to be built on a plot of ground opposite Ely Porta, and will include accommodation for masters' and servants' offices, as well as the dormitories, day-rooms, and studies for the boys.

Alterations are to be made also in the old buildings, in what is now the head master's house and dormitories. This will be carried out with the utmost care, for these buildings are a part of the ancient monastic buildings, and are of great interest. The dormitories and day-rooms are in a long block on the east side of "The Gallery," 118 ft. by 28 ft. wide, built about 1180, at the time when the lower portions of the Cathedral, west front, and transepts were in hand, and raised and altered by Alan de Walsingham, about 1320. This block then formed the "guests' dormitory." That great architect removed the former wooden floor and inserted a new floor, carried on pointed arches and vaulting. He raised the walls, re-using, in some instances, the beautiful Norman corbel tabling, and inserted larger windows in lieu of the very narrow original ones, some of which still exist, though blocked up.

Adjoining this block, and communicating with it at its north-eastern angle, De Walsingham built a "reception-room for the guests," opening (by a passage now destroyed) into the guests' dining-hall at its south-west angle. This hall (now the deanery) is a magnificent building of the thirteenth century, much altered in later times. This reception-room was known as "The Fair Hall." It is 50 ft. long by 24 ft. wide (outside), and is constructed with all the skill and science of which Alan de Walsingham was a master. It is in four bays, on a lofty-vaulted substructure. There are existing perfect windows in two bays, and at the south end remains of windows in the other bays. Although the height is 35 ft. to the cornice, the wall is only 16 in. thick; but by means of arches resting on grand corbels, the weight of the roof is brought on to the buttresses, which are of considerable projection. The tracery of the windows is of the beautiful type then used at Ely. This hall is of about the same date as the beautiful Prior Crauden's Chapel opposite, with which it was connected by a gallery.

These buildings are to be modified and altered to suit the new requirements, and will be

carefully done, so as to bring out and retain their interesting characteristics and details as far as is at present practicable.

The works will be carried out for the Dean and Chapter of Ely under the direction of Messrs. Carpenter & Ingelow; and plans are being prepared by them for the next meeting of the Chapter.

THE GLASGOW BUILDING TRADE.

Sir James Watson, Lord Dean of Guild for Glasgow, at the last court of the session, held on the 26th ult., made a speech, in the course of which he dealt with the position of the building trade in the city. It had had, he said, a series of years of continued commercial prosperity, which, lasting till near the end of 1875, led to a demand for improved dwellings on the part of many who had profited by that prosperity; while, in addition, the operations of the School Board for the erection of their numerous schools and schoolmasters' houses helped materially to increase the stimulus. The consequence was a rage for speculation in property, which changed hands at greatly enhanced prices, and gave rise to an extensive amount of building, until it was found, by about the middle of 1877, that the supply exceeded the demand, and that over-production in this, as in other cases, had led to a serious and rapid decline. They found accordingly that, while for the year from September 1st, 1875, to August 31st, 1876, the "linings" granted by this court for the erection of property amounted in value to 2,125,249*l.*, those granted in the following year, viz., from September 1st, 1876, till August, 1877, amounted in value to 1,564,360*l.* Since then the linings granted had greatly diminished, those granted from September 1st, 1877, to August 31st, 1878, amounting to 755,717*l.* One of the evils resulting from the building speculation was that it induced men with insufficient capital to rush into the trade, to purchase ground at high prices, borrow money at high rates, and after having so far proceeded with the erections, find that from want of funds they are unable to finish them. The result had been a serious loss, if not a ruin, to these persons, while the inconvenience to the public from barricades standing while no work was going on had been considerable. It was not for him to say how long the present decline might continue, but it was only reasonable to expect that it would revive when trade recovered from its present depression. Looking to the serious accidents which occurred in other places from insufficient ingress and egress in public buildings, in cases of panic, the court thought it right to order a strict inquiry to be made in regard to this in the various churches, theatres, and public buildings, and the result had been satisfactory, such persons as had buildings in any way deficient of these requirements having readily agreed to the wishes of the court. In conclusion, he thanked the sub-dean (Mr. James King), the members of the Bar, and the officials, for the assistance they had rendered him in the court.

It is stated that the Merchant House have unanimously agreed to appoint Mr. John Muir, merchant, as Sir James's successor.

THE CARLIOL TOWER, NEWCASTLE.

NEWCASTLE SOCIETY OF ANTIQUARIES.

At the monthly meeting of the Newcastle Society of Antiquaries, held on the 25th ult. in the Old Castle, Mr. Martin Dunn in the chair,—Mr. W. H. D. Longstaffe said a public meeting was to be held in the town to protest against the destruction of the Carliol Tower. Seeing that Newcastle was now losing everything of interest, so far as the history of the town was concerned, he thought the Society should demonstrate against the destruction of the tower. They should make some attempt to preserve the remaining towers and portions of the wall. He had walked round the portions of the wall remaining. He was aware there was very great dispute about the date of the wall. The eastern wall was exceedingly good masonry; when they got to St. Andrew's Church it was exceedingly bad; and beyond St. Andrew's Church there were certain breaks in the masonry. They should preserve every tower and piece of the wall which now remained. He exhibited a photograph of the east end of St. Andrew's Church as it was before its restoration a few years ago, and said that up to that time there was a very delicate and beautiful piece of architecture at the east end of the church, and the masonry was good, and there was no need to pull it down. The churchwardens and folks chose to pull down the east end gable, and build a new gable, and the old line was completely obliterated. They might go and see the place; he did not like to go, as it was very disgusting. He brought this forward to show how silly it was to destroy pieces of ancient work. The castle was falsified some years ago, before his time; and when he was writing the history of it, he had to go to some ancient etchings or engravings to see what it had been. The door, the oriole, and the original appearance of the chapel, had been destroyed; and one had to grope out, as well as could be done, the history of the building. They could not bring these ancient things back, but they might put a stop to further destruction. When Mr. Bell wrote to him about the Carliol Tower, he thought it well to put Carlyle, Ruskin, Hunt, and other people who really had the voice of the nation with them, in motion on the subject, but they would not meet for about a fortnight. If the Carliol Tower was to be destroyed, it should be done in broad daylight. It might be destroyed, and they perhaps could not help it any more than they could help the falsification of the castle; but if it was to be done the same as the Black Gate, then it should be done in broad daylight. He concluded by moving:—

"That this Society petition the Town Council not to remove or destroy, or consent to the removal or destruction of the evidences of the history of Newcastle-upon-Tyne, and especially the remaining relics of the wall and towers."

Mr. Oswald suggested that special reference should be made in the motion of the Carliol Tower.

Mr. Longstaffe said he had written to the Society for the Preservation of Ancient Monuments, stating that for many years past there had been a persistent destruction of ancient monuments in Newcastle; and he now wished the motion not to refer to only one tower, but to all the ancient towers and wall.*

CLERGY-HOUSES.

Folkestone.—On the 24th ult. the Archbishop of Canterbury laid the foundation-stone of the new vicarage at Folkestone. The building will be Early English in style. It is estimated to cost 2,500*l.* The builders are Messrs. R. & D. Baker, and the plans have been prepared by Mr. Ewan Christian, the diocesan architect. The building will have a sea frontage of 67 ft., and an elevation of 44 ft.

Ripley.—On the 23rd ult. the memorial stones of a minister's house adjoining the Ebenezer Chapel, Ripley, were laid. The house will cost nearly 600*l.* The architect is Mr. Geo. Eyre, of Codnor; and the contractors Messrs. Wetton & Worley, of Ripley.

PROPOSED LIVERPOOL EYE AND EAR INFIRMARY.

Not before it was wanted, a new building for this institution is about to be erected from the designs of Mr. C. O. Ellison, architect, Liverpool. We give a view of the exterior. The style adopted is English Domestic Gothic. The materials employed are red brick and sandstone. The picturesque appearance of the building is greatly due to a somewhat novel management of the dormer windows. The building consists of a main block facing Myrtle-street, and two wings—one containing the out-patient department facing Stowell-street; the other running parallel with the gymnasium. The wards are capable of accommodating eighty patients. Special wards have been provided for cases of a contagious nature, and a few private rooms have been set apart for patients who can afford to pay. The minimum allowance of air per patient is 927 cubic feet. Each ward is in direct communication with a nurse's room. The lavatories and offices are arranged with a cross ventilating passage between them and the wards, so that they are separated from the interior of the building. There are four sitting-rooms for the use of those patients who are not required to remain in bed. In the centre of the main block, equi-distant from the male and female wards, is the operating theatre. A large bay window facing the north will afford the steady skylight needful for the performance of delicate operations. Space has been provided for the accommodation of students, and two waiting-rooms for patients communicate directly with the theatre. In the administrative department, rooms are provided for the house-surgeon, a resident pupil, matron, nurses, and a staff of servants. The Board-room and smaller ante-rooms for visitors, &c., open out of the entrance-hall. The general wards and corridors will be warmed by means of hot-water pipes; other apartments by means of open fire-places. Fresh air will be admitted by tubes in the floors, and by an arrangement of double sashes in the upper part of the windows. Foul-air chambers or tubes will be placed in the roofs of the wards and corridors, communicating with a large extracting shaft. In this an upward current of air will be maintained by means of the heat generated by the kitchen and boiler flues. The shaft terminates externally in a lofty *flèche*.

The work of the out-patient department will be carried on in the west wing. Patients entering by Stowell-street will be admitted into a waiting-room capable of seating nearly 200 persons. At the north end of this is a room for the clerk, whose duty it is to investigate the eligibility of applicants for charity, to issue prescription notes, &c. Beyond is the consulting-room, lighted by a large window facing the north, and communicating on one side with a small operating-theatre, and on the other with a dark room for the use of the ophthalmoscope. After consultation, patients will proceed to the dispensary, where they will obtain their medicines, and then pass out into Stowell-street. By means of barriers and turnstiles, arrangements have been made for the management of the crowd of out-patients, so that the work can be accomplished quickly. The out-patient department is entirely separate from the interior of the hospital, but communicates with it by means of a glass-covered passage. Some idea of the magnitude of this department may be gathered from the fact that, in 1877, the total number of separate applications was 10,015, that these patients attended and were prescribed for 38,750 times, and that 480 operations were performed. The estimated cost of the new building is about 15,000*l.*

THE CHOIR-SCREEN, DURHAM CATHEDRAL.

The Northumberland and Durham Archæological Society paid a visit the other day, unexpectedly, to Durham Cathedral, and denounced in unmeasured terms the choir-screen, the pulpit, the reading-desk,—in fact, all Sir G. G. Scott's new work there; Mr. Longstaffe and Mr. E. R. Robson, of the London School Board, being the most sweeping in their abuse.

Some of our readers may be glad to see what the much-condemned screen is like, and we give a view of it.

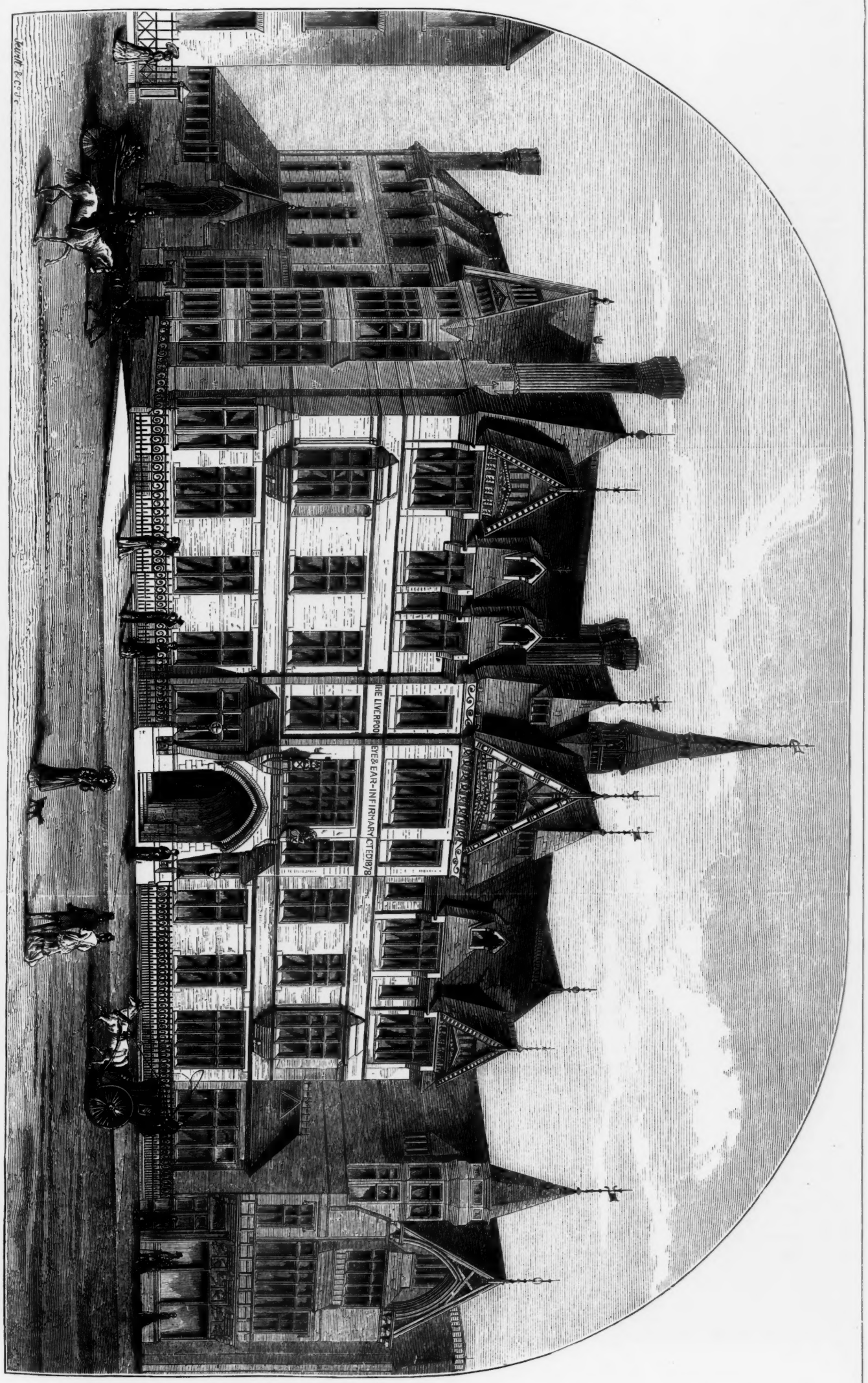
It is of very massive character, being 3 ft. thick, 33 ft. long, and 36 ft. high to the top of the cross. It is constructed wholly of Cumberland alabaster and marble. The supporting cluster-shafts are of Frostaly fossil, which in Durham takes the place of Purbeck marble in the southern cathedrals; the caps, annulets, and bases are Devonshire marble; and the spandrels are filled with mosaics, to harmonise with the pulpit. The cross in the vesica is a copy to large size of the pictorial cross of St. Cuthbert, now preserved along with his vestments in the library of the cathedral, and consists of gilt metal, with mosaic of red jasper. The step on which the whole stands is of black Dinart fossil.

The screen, pulpit, and marble mosaic floor of the choir have all been executed by Messrs. Farmer & Brindley, the late Sir Gilbert Scott, as already mentioned, being the architect.

Edge's Patent Grooveless Tramway System.—This system, patented by Mr. Edge, well known as an architect in Birmingham, proposes to combine the advantages of the present system without the danger and inconvenience to ordinary traffic, arising from the grooved rail now in use. On the face of it much annoyance would be saved to the occupants of other vehicles. Upon reference to the drawings and models it is seen that the rails are provided with a series of equi-distant round or oval holes through the top part or plate, the wheels being supplied with corresponding projecting studs of conical shape, either round or oval at their base. How this may work in practice time will be required to show.

* A protest against the destruction of the tower has already appeared in the *Builder* (see p. 998, *ante*).

THE CHOIR-SCREEN, DURHAM CATHEDRAL.—The late Sir G. G. Scott, R.A., Architect.



THE LIVERPOOL EYE AND EAR INFIRMARY.—Mr. C. O. Ellison, Architect.

ON SANITARY CO-OPERATION.*

Chaucer uses the word sanative, and so does Bacon, but sanitary, or sanitation, connected with the science of public health, is not nearly so old as our patriarchal president, Mr. Chadwick, who, I am inclined to think, was the father who invented the term sanitary science.

In this year of grace we have sanitary newspapers,—the *Builder* and the like papers,—and here is a Sanitary Institute sitting, which is not yet old enough to be recorded in "Whitaker's" or other almanacks, or such like registers.

There was once a Public Board of Health, and there may be again. The Society of Arts and other public bodies do duty for it, and discuss health continually. In the mean time, public opinion on sanitary questions of all kinds is gradually fermenting, and is still working its way. Health has even crept into the Revised Code of the Education Department, and public grants are made to encourage a knowledge of its principles according to rules which make it difficult for schools to earn the grant. The Local Government Board virtually is responsible for doing what a public department might do if it pleased to advise upon and promote the health of the people throughout the kingdom, except in the metropolis, which is protected by vestries, and the representatives of vestries, and as respects sewage, can do nothing better than pollute the Thames with it, and suffocate unfortunate wretches who are immersed in it. The Local Government Board is afraid to do more than follow in the wake of public opinion, at a safe and long distance. Reports and returns are printed by Parliament, which are far more difficult to buy than a newspaper or any sanitary paper, and are not systematically to be found even in public free libraries,—not in the excellent reference library at Manchester, or even in the British Museum, until a long time after publication. No authority is charged to make the information known. Our ancestors once stuck public notices of Acts of Parliament and proclamations on the church-doors, but the practice is hardly followed now. And yet health and religion are companions, and the work of churches and chapels in all their phases of thought, which would, I think, be helped; but then the Home Office should take measures to inform the registered ministers of religion when all the publications which were issued by Government to promote a knowledge of public health appeared, and I venture to recommend this Institute to consider this suggestion, and, if need be, cause it to be discussed in Parlialiament. Year after year Parliament makes laws permissive rather than obligatory, and the execution of them is a dead letter, comparatively.

Mr. Cresswell, in an admirable paper read at the Health and Sewage Conference of the Society of Arts, last May, which should be carefully studied, observes,—"There has been a redundance of legislation embodied in a tortuous series of enactments." The Public Health Act of 1848, the Nuisance Removal Act of 1855, the Local Government Act of 1855, the Sanitary Act of 1866, the Sewage Utilisation Acts of 1865 and 1867, the Pollution of Rivers Act of 1876, and a Consolidated Act, "The Public Health Act," 1875; and, lastly, a Water-Supply Act in 1878, brought in by Mr. A. H. Brown, the member for Wenlock. Mr. Cresswell continues to say, "Legislation has dragged its slow length along, while events have galloped with portentous haste, and neither imperial nor local effort keeps pace with the needs and expectancy of the nation. In 1876, popular excitement induced a palliative measure in the Rivers Pollution Prevention Act, but that measure has failed of its purpose, and given to wrongdoers a quasi-legislative sanction for their delinquencies and incapacity. At the same time, the Thames Conservancy Acts of 1857 and 1867, after much ado about nothing, have suffered a palsy, and received their *quietus*,—for a time, at least,—in the Lower Thames Valley Drainage Act of last year. In the meantime, a cry has gone up for water,—water for the food and ablutions of man, as well as the requirements of our great staple industries. Every river, from the Tay to the Dart, has been contaminated with the refuse of homestead or factory. The salmon kelts of Westmoreland and Cumberland are in process of destruction by a parasitic fungus plant, the newest development of sewage pollution; and, while professors dispute as to final causes, and means of prevention, the patient public waits for the *Deus ex machinâ*, in the form of some miraculous intervention, to save them from the natural consequence of their own apathy and ignorance. In presence of these and other startling phenomena, where shall we seek the signs of progress, or compute the net results of practical sanitation? . . . . In this respect it may be expedient to reorganise the Local Government Department, and readjust it on its own proper bearings. Further legislation in this direction will rid us of that red-tape and circumlocution which encompass every limb, and paralyse the functions of local bodies, reducing independent self-government to the shadow of an empty name. From the investigation of a grand scheme of arterial drainage to the contents of a workhouse plum-pudding, is a wide range of official supervision, yet nothing is too large or too minute for the elephantine prehension of the Whitehall department. There is a veritable plague of inspectors abroad, and the native stubbornness of the provincial mind, although it may need the spur and impulse of the central authority to set it in motion, resents this constant yoke of official supervision, which will not permit the expenditure of a few pounds, or the construction of a workhouse pigstye, without a local inquiry and departmental sanction. This was not the intent of those who framed the Public Health Acts, nor is the system compatible with the divine right of self-government. The functions of imperial administration end where those of local self-government begin; each has its proper uses in the economy of the State; and there is scope enough for each within its own particular province. The Rivers Pollution Prevention Act is in point. Such is the superfluity of safeguards and precautions in the provisions of that Act, that none save a Government department would venture to put it in force; nor can a sanitary authority take any proceedings under it without the consent of the Local Government Board. Here, then, was a field for the energies of Government, where both the resources and influence of the State might be usefully employed. Yet nothing has been done to enforce or direct the operation of an Act which is, as it were, stillborn, and truly a most lame and impotent piece of legislation! On the contrary, we can cite cases where local enterprise has been hampered; and official interference has blunted the edge of many a bold resolve on the part of those who have striven, humbly, but honestly, to help themselves." What, then, can be done? We can say what ought to be done, but it may be years before impediments are removed and the work be done. So I offer some suggestions as a beginning; better, I hope, than remaining as we are. My suggestions will apply to the pollution of rivers by sewage, which, for the last two or three years, I have had reasons for studying.

You cannot remedy the pollution of a river unless you can get some federation of interests, and treat the river, from its source to its discharge into the sea, as a unit, and look to see that the whole work is done properly, in the interest of all the places which empty sewage into the river or its tributaries. Voluntary co-operation here, at present, is indispensable, and may be possible, but Government alone can make it obligatory, which it has shrunk from doing. Self-interest may be called into action. Take the case of the rivers Irwell, Irk, and Medlock, flowing through Manchester. Purification of the rivers in Manchester and Salford is paralysed because the towns above have not begun to remedy the nuisance of their own sewage, but send it down to pass Manchester on its way. Oldham and Rochdale have done nothing, therefore Manchester does nothing.

There is an instance nearer at hand which the Institute may examine on the spot. The Trent is at present made the common sewer for all the pottery towns from Tunstall to Stafford, rendering Trentham Hall almost uninhabitable. These towns are so independent and republican in spirit that they will not co-operate. Co-operation, as affording the best and cheapest way of proceeding, has been recommended by all the local surveyors. The towns know it well, but have it they will not, and each will have its own system, although at greatly augmented cost and reduced efficiency, with a great likelihood that twenty years hence the work will have to be reformed. Thus Tunstall adopts a feeble precipitation system dirtily carried out. Burslem, the next town, adopts irrigation at very great and unnecessary cost, almost sure to be reformed in future years. Then Hanley has its own independent precipitation scheme of some kind, which will be burdened with sludge; whilst Stoke-on-Trent, at every meeting of the Council for years past, has oscillated between irrigation, or filtration, or precipitation, or a jumble of all, one meeting undoing what the last meeting settled, whereas one main drainage along the River Trent, and one outfall would have cleansed the pottery towns for all time and at far less cost in the end. But the towns flinch from doing the simple problem of arithmetic in settling among them the proportions of the cost!

Mr. Cresswell thinks there is a ray of light in the darkness afforded by the Bill lately before Parliament for the constitution of County Financial Boards, or local parliaments in every county. Alas! this Bill never passed, and even if it had, I doubt if it could deal with a river passing through several counties like the River Trent. Each county would have to agree with several others in establishing one conservancy. The Trent begins in Staffordshire, passes into Nottinghamshire, then Lincolnshire, and gets to the sea in Yorkshire, collecting eighteen other streams, besides several tributaries.

The House of Lords, on the 23rd of March, 1877, appointed a Select Committee to enlarge the powers of authorities over drainage and river navigation, "so as to provide more efficiently for storage of water, the prevention of floods, and the discharge of other functions." The Committee consisted of the following most qualified members to judge on this subject:—The Duke of Richmond and Gordon (the Lord President), the Duke of Bedford, Duke of Northumberland, Marquis of Salisbury, Marquis of Ripon, Earl of Sandwich, Earl Cowper, Earl Stanhope, Viscount Eversley, Lords Monson, Vernon, Stewart of Garlies, Meldrum, Ker, Penrhyn, Somerton, and Winmarleigh. The Committee passed a unanimous report. They "entirely concurred with the witnesses that to secure uniformity and completeness of action in dealing with each river, each catchment area should, as a general rule, be placed under a single body of conservators, who should be responsible for maintaining the river, from its source to its outfall, in an efficient state," and are of opinion "that the Conservancy Boards should be enabled to execute the powers for the prevention of the pollution of rivers, conferred on local authorities by the Rivers Pollution Act."

Purification of rivers is obviously connected with supply of good water, and both are connected with the proper preservation of water, and all should be under one authority.

Until public opinion emboldens the Government to adopt this wise principle, so authoritatively recommended, that a whole river shall be under a single authority, and enforce it, I throw out for the consideration of the Institute the suggestion if commercial principles may not be applied at least to initiate a system of helping the purification of a whole river from its source to the sea. Commercial companies were formed to establish and work railways, and supply gas and water. If commercial companies had not been formed to provide railways, when would they have been started by our Government in this free country, which only follows public demands cautiously? Constitutional Governments do not originate measures.

A public company might be formed to manage the purification of the Trent on the best known scientific principles, with far greater economy and efficiency than the many towns, each by itself polluting the Trent, could do it. Such a company might deal not only with the sewage, but with manufacturing refuse of all kinds.

We may hope that the letter which the Prince of Wales addressed to the Society of Arts, as its president, on the National Supply of Water, may start public investigations into the catchment basins of rivers,—inquiries that will have useful connexion with the purification of the rivers. In the meantime, let private enterprise try what can be done, until Government, as with telegraphs and local intelligence, has ripened up for universal action in treating water sewage.

* By Sir Henry Cole, K.C.B. Read at the Stafford Congress of the Sanitary Institute, October, 1878.

Questionable "Mortar."—At the Edmonton Petty Sessions last week, Frederick Bryen, builder, was fined 5*l.* and costs for using mortar on buildings in Tottenham which had not been approved by the Local Board of Health of the district, as required by a bye-law of the Board, framed in accordance with the Public Health Act, 1875.

THE HIGH-LEVEL BRIDGE QUESTION AND STATE OF METALLIC BRIDGE ARCHITECTURE.

Sir,—Allow me to thank you for the insertion (on the 14th ult.) of my letter respecting the proposed Tower Bridge. I assume your willingness to afford me an opportunity of showing that the art and science of wrought-iron (and steel) combination in relation to bridges are in a crude and unsatisfactory state. But in order to exhibit the scope of my views, and, as nearly as possible, bring your readers to the same point and scope of observation, I must beg your permission to make some general remarks connected with the subject. Some forty years ago, George Stephenson enlightened Dr. Buckland with the truth that the passing railway train they were observing from Tapton House was being driven by sunshine that had been "bottled up" in a pre-adamite age. Since then Dr. Joule has demonstrated the equivalence of mechanical force and heat; and shown us that they are, as Emerson says of cause and effect, "two sides of one fact." But there is another truth which I am not aware that particular attention has ever been drawn to, which appears to me little less interesting to the philosopher and valuable to the mechanician: and specially so, to ship and bridge architects. The appellation I will give (till a better is found) to the truth or idea I mean, is "The advantageousness of banking strength in structures for resistant purposes to the extent of their capacity." Such banking, looking at it from the broad interest of humanity (not with the squint eye of swinish speculation, or the contracted vision of a to-day's economy), is, I submit, capable of yielding a profit that does not accrue from either of the two beautiful truths before mentioned. The one-pound-power of sun-heat that was stored in a tree beneath whose shade juvenile mammoths gambolled, is to-day only a pound of power that, like a shilling, can be spent no more than once. But in a ship or bridge (and many other things), from the steam-engine, hydraulic or screw-jack, the human arm, and other means, weightless power may be transferred, absorbed, and fixed. Speaking roundly, 100 lb. of power employed for an hour would endow a fabric with a pound of power of resistance that may be used thousands if not millions of times over. If "cast upon the waters" in the building of a ship, compound interest as well as capital expended in that weightless strength may be found amid the fury of a storm, and the "bread" of life returned "after many days" in the form of a literal fifty years. I believe it is quite possible to reduce the loss of life and property by ship casualties at least half, consistently with a broad economy.

Please to grant me here, Sir, the digression of stating that, though my present subject is bridge improvement, I regard ship improvement as of more than tenfold the importance; and that if I should prove able to contribute to the former, I purpose to use the status thus acquired for obtaining attention to my views on the latter.

Next to ships, I contend it is desirable that all possible strength should be put into bridges. The late Sir W. Fairbairn identified himself with such principle in claiming credit for increasing the rate of strength of girders by altering their forms; speaking of such improvements, he says (p. 93 *),—"They are not only highly interesting in themselves, but involve practical considerations of deep importance in relation to the future interests of civilised society." I submit, then, that any bridge-architect who is content to copy the designs of his predecessors, with no more of originality than consists in making a coat of a given pattern in fine cloth for a large man, instead of making it of coarse cloth for a small man, with mere adaptation, must have a very inadequate idea of the claims of his creative noble profession, and the duties of its members. Before determining upon a design (for any work of magnitude involving deep science), surely the architect ought not only to read the best written books upon the subject, but, remembering that,—

"To the solid ground
Of Nature trusts the mind which builds for aye,"

take also the book of Nature in hand, and setting his phrenological No. 9 to work, till it swells and feels as if it had been punched on both sides, "leave no stone unturned" to try and discover if anything that has hitherto been done can be altered with advantage. To evade the obligation of thus tasking ourselves is to live ingloriously upon dead men's brains, and only exercise our own in that talent which Bacon calls "left-handed wisdom."

My first argument is the introductory one of putting Fairbairn himself in the box, as a witness in favour of a further, full, and, as far as possible, exhaustive inquiry upon the subject. At page 145 he says:—"Our knowledge of the properties of wrought-iron beams and girders may be considered as still very imperfect, and confined within an exceedingly narrow compass." And in his opening remarks, Part IV., speaking of bridges, he says,—"Surely, then, every improvement and every new application, which increases our power of contending with the irregularities of the earth's surface, is entitled to the most careful consideration of the philosopher, the engineer, and the community at large."

When I framed the question,—"Is the art and science?" &c., I purposed to discuss, first, the artistic form or architectural character of existing styles of iron bridges. But I now think that it will be best to begin with the more strictly scientific, or combination and utilitarian, part of the question; because, if the present forms are the most economical and useful possible (or it cannot be shown that they are not), the question is reduced to this,—How much material and money shall we waste or expend merely for taste and appearance? For, I trust, obvious reasons, I must decline fully describing here my plan of bridge; but I shall describe its outlines and some other particulars for comparison with Sir J. Bazalgette's plan. The first practical point of the subject I will notice is the strength of the steel of Sir J. Bazalgette's proposed bridge. In an article lately upon the subject in the *Morning Advertiser*, it is stated that four steel arch girders would each be of the *required* weight of about 640 tons, "while an iron girder *would be* 1,600 tons." It is put "800 ft." span, but whether 800 ft. or 850 ft. is meant does not much affect the argument. At the above reckoning, the saving of weight in the girders alone would be 3,840 tons. If we say 160 tons saved in other steel parts, we have 4,000 tons total reduction. I will assume that the weight of all the metal contributing to strength is 5,000 tons; that of paving and all other materials not contributing to strength is 2,500 tons, making a "permanent weight" of 7,500 tons; and that the load is estimated at 2,500 tons: we then have a total of 10,000 tons; margins of strength being equal in both cases, the weight, if the girders were iron, would, of course, be 14,000 tons; so that the *rate* of strength would not be as it appears, 2½ times, or steel 250, iron 100, but only ten-fourteenths of 250; viz., 171·2 steel, 100 iron. I will give steel the benefit of reckoning its strength 175, or seven-fourths of the strength of iron, and upon that basis let us see about what the quality is of the steel intended to be used for the Tower Bridge. Fairbairn (p. 217) tells us that by four-line chain riveting he obtained 24·4 tons to the square inch, "*nearly* equal" to the strength of the "solid plate." I have also a printed report of a set of experiments upon boiler-plates at the Testing Works of Mr. Kirkcaldy, Southwark-street, London. The *mean lengthway* tensile breaking strain was (per square inch) annealed, 50,466 lb.; unannealed, 53,405 lb.: so to "keep within compass" *in relation to the argument* I will call the lengthway strength of iron 25 tons or 56,000 lb., seven-fourths of which would be 98,000 lb., or 43 tons 15 cwt. I venture to assert that steel of only such strength is of a very poor quality. I would use steel that would have as great a rate of advantage over the steel proposed to be used (according to the *Morning Advertiser* writer) for the Tower Bridge as that steel has over wrought iron. I admit the steel so intended is probably of as strong a quality as it is expedient to *punch* rivet-holes in, but that does not prove that such punching is the best possible plan of either steel or iron combination. I propose to use a cast steel having a strength of 100 tons to the square inch. And as some may think this too high a calculation, I appeal to the following evidence to show that it is not an extravagant one. In "Chambers's Information" we are told, in a paragraph upon tenacity, that steel wire of a hundredth of an inch diameter has a strength of 134 lb., which is at the rate of more than 761 tons to the square inch,—more than 7½ times the rate of strength I propose to use. And when I say that (exposed to tensile strain) I intend to use steel plate not exceeding a quarter of an inch in thickness, and steel rod not exceeding a seventh of a square inch in area, I think it must be admitted that there is nothing unreasonable in my expectation of such calculation being realised.

I will next endeavour to show that the rivet system of combination does not and cannot develop the strength of iron (or other material) within a very considerable percentage; and that it is a system having several objections. Unfortunately, Fairbairn does not give us (at least I have not found it) the proved or calculated transverse strength of a simple wrought-iron girder of equal breadth throughout the depth; so I must do the best I can without. He gives (p. 74) 472 lb. as the centre or transverse mean breaking strain of 1 in. square bars of Low Moor cast iron (No. 2) on a span of 54 in.; and at p. 78 he gives 15,458 lb. as its tensile breaking strain, so that the transverse strength is (at 54 times length to depth) to the tensile as exactly 1 to 32·75. The lightest proportioned tubular or box-girder bridge I have met with in Fairbairn (p. 227) is one of 300 ft. span; the permanent weight of which is 1¼ ton per lineal foot, and also 1½ ton rolling load per lineal foot; how much of the permanent weight is ballast and other material not contributing to strength is not stated; and so I am obliged to strike an average of half a ton, which appears about fair; for it must be admitted that transverse girders and ties do contribute to strength. So we have an average of a ton of wrought iron to the foot of length—300 tons. As the centre is thicker in the flanges, and more than mean depth of the whole bridge, I reckon its section at a *mean*, not the *actual*, sectional area, at the rate of 25 cwt. in lineal foot, which would, at Dempsey's rate of 440 lb. the cube foot, give 911 in.

But I must halt, having yet to beg a post-script, and hope, with your kind permission, "to be continued" in a third letter. C. G.

P.S.—I have read with much satisfaction Mr. Matheson's letter in your number of the 21st ult., corroborating so fully, as it does, the opinions expressed in my first letter to you, published in the *Builder* of the 14th ult. I feel personally obliged to Mr. Matheson for his exact information upon up-hill haulage, if it is (as I have no doubt) well founded. If then (as Mr. Matheson states) the expenditure of force on a smooth straight hill of 1 in 40 is 86 lb. to 30 lb. on a smooth, level road, I think we may safely reckon that it would be 20 lb. additional on a spiral curve of the same gradient, making a total of 106 lb.,—fully three-and-a-half times the labour of a smooth level road of the same length. If we accept Mr. Hanson's statement at the Common Council, on the 2nd of May last, that the length of the spiral road would be 714 yds., and measure the length by the multiplied force of three-and-a-half,—the direct distance of 500 ft. from the water side to the approach terminus,—we get 7,497 ft. And after deducting the 500 ft., there is a dead loss, as on a level road, of 6,997 ft., or nearly a mile-and-a-third; measured by time to a vehicle going at nine miles per hour, it is equal to a detention of eight-and-half minutes; to a vehicle going seven miles per hour, a detention of eleven minutes; at five miles per hour, a detention of over fifteen-and-a-half minutes. Taking the average at eleven minutes, my lift plan, already mentioned, would only be half as much loss of time.

Mr. Matheson, agreeing with me in the expediency of a competition of designs, says,—"The competition either to be open to every one," "or let a certain number of the leading bridge engineers of the world be invited." "Open to every one," I emphatically say. It cannot do harm, and may do good. Last week I mentioned Paxton. Pardon my reminding Mr. Matheson that the Exhibition Commission was a Babel of profitless babble till a gardener came to the rescue. It, too, should not be forgotten that the only time that Lord Palmerston what is called made a fool of himself in Parliament was when, through believing in the infallibility of the magnates of 25, Great George-street, he made himself their mouthpiece, and told the House of Commons that the Suez Canal was impracticable. As an English artisan, I protest against the faith and doctrine of the all-sufficiency of one or a thousand "guinea-stamp" C.E.s.

"A man's the gowd for a' that."

If other instances were not almost "as

* See "Fairbairn on the Application of Iron to Building Purposes," including a "Treatise on Wrought-Iron Bridges." Which work is always referred to by the writer in connexion with the name.

plentiful as blackberries," "Watt" we know of the progress of the steam-engine is a proof to the contrary. I submit that from the days of Columbus, at least, but few brighter mental stars have ascended to the empyrean of human intellect than those which have risen from the ranks of labour; and that a history of science in general, or of engineering in particular, in which they were unmentioned, would be a good deal like a celestial globe with the signs of the zodiac left out. C. G.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

A SPECIAL general meeting of the subscribers and friends of this Institution was held at the offices, 27, Farringdon-street, on September 24, Mr. Thos. F. Rider, president, in the chair, when Mrs. Hannah Wade was duly elected a pensioner on the funds, and a resolution for increasing the annual pensions from 20*l.* to 25*l.* for men, and from 15*l.* to 20*l.* for widows, was carried almost unanimously.

Previously to the passing of the latter resolution, Mr. Rider said, "In urging this proposed increase in the pensions, I wish particularly to point out the greatly increased cost of living since your Institution was established ten years ago, and that the Builders' Benevolent Institution, upon the model of which your own was formed, have recently raised their scale of pensions upon the same ground. I hardly know whether the fact of our having only one candidate for the vacant pension, who has this evening been elected, is a subject for congratulation or not. On the one hand it may prove there is not much destitution at the present time among builders' clerks, or it may prove, as I more fear is the case, that your Institution is not sufficiently known throughout the trade to bring before us all the cases eligible for the assistance we have so much satisfaction in giving. Your treasurer reminds me that it is no part of the duty of an institution to seek for candidates, but to attend to the relief of such as seek its aid. Still I am very desirous that this Institution should be known in every builder's office in London. I am well aware that the increase in the amount of pensions will necessitate increased exertion on our part to provide the funds to meet it, but I would not have you at all timid on this point. Attend well to the relief of the necessitous, and you will have a strong case in appealing for new and increased subscriptions. I notice the same occurs in your Orphan Fund, and that there is only one candidate for the presentation you are about to purchase in the Orphan Working School."

At the close of the meeting the following donations were announced:—Mr. T. F. Rider, 10*l.* 10s. (and 1*l.* 1s. annual subscription); Mr. E. S. Rider, 5*l.* 5s.; Mr. Charles Kynoch, 5*l.* 5s.

ELLESMERE, SHROPSHIRE.

A NEW college is to be built near Ellesmere, as briefly mentioned in our last, on a site secured on easy terms from Earl Brownlow, commanding a magnificent view of the Welsh hills from the Vale of Llangollen to the mountains near Llanymynach. The college will be in connexion with that of St. Nicholas at Lancing (Sussex), and is intended (like that at Ardingley in Sussex) for the middle classes of the district. The school will be a boarding-school for 500 boys. The buildings are to be commenced at once, from the designs of Messrs. Carpenter & Ingelow, the college architects, and will eventually include chapel, dining-hall, with crypt under (to serve as a temporary chapel), offices, school-rooms, and class-rooms, with dormitories and day-rooms, and masters' blocks of rooms. and separate houses for the head and second masters, with dormitories attached to them. The material will be local bricks, with dressings of Cefn or other stone, and mouldings of Ruabon bricks. The cost is estimated at about 50,000*l.*, inclusive of all expenses.

ON "SHAMS."

SIR,—It would seem, then, that when a tragic actor "dies" upon the stage, he really does die; that when he performs, acts, or mimics Julius Cæsar, he really and truly is Cæsar; and also, that when a painter paints "flesh" and "cloth of gold," and the sapient critics stand round the picture, and fancy themselves Sir Oracles in exclaiming "marvellous!" the painted "flesh" and "cloth of gold" are also the real things, and not "shams." Now, your supersensuous art-being calls a piece of either good marbling or of good graining a "sham," but the "flesh" and the "cloth of gold" marvellous work, when the only difference between the two is a difference of degree, and not of kind,—that the one is much easier to do than the other. Truth in art is a relative truth,—a truthfulness in relation to the object which it shams, mimics, or portrays. The *ideal* in art is a truthfulness to the abstract conception, and not to the accidents, the individualities, of nature. The artist who aims at abstract truthfulness is he who "shams" wisely.

"Shamming" is a good word,—an exceedingly good word,—a word which was used with a suppressed fund of mirth behind it,—which was used, indeed, unreservedly to children who feigned sickness, sleep, &c., or to grown people assuming without *mal prepense* various characters and moods. But the morbid critic has now done his worst to begrime and blacken it. We do not call base coin "sham," but either spurious or counterfeit. I believe that I am perfectly justified in applying the word "sham" to the mimicry and feigning of pictorial and dramatic, and the "romancing" of literary art. Your modern critic appears unable to separate the innocent "sham" from that immoral counterfeit which is intended nefariously to deceive. His notions upon art are in inextricable confusion; he does not even understand the manifold changes in the signification of the word "nature" which he is continually bandying. My last letter covers the whole ground of the matter, in so far as a single letter can, in a general way, do so. And if that be attentively and coolly read, I believe it will be found to contain the principles of art in a nutshell, and also what your correspondents, in those points on which they are right, only reiterate. My views are not the reaction from one extreme to another, but aim at rightly dividing the truth, and at unmasking nonsense in a serious garb.

Popular sayings often contain a world of truth. That,—that "beauty is but skin deep," is no exception. All that is *real* in pictorial and plastic art lies on the surface, and this superficial *reality* is more valuable than silver,—ay, than fine gold. The truth and the reality of art consist in its being conformed to the taste, the judgment, of the highest human nature. This constitutes the real gold, in comparison with which gold itself is but tinsel and counterfeit, and other things but leather and prunella. When fine taste rather than much gold and quantities of silver shall be the criterion of social status, it will be well for art and for England.

I was not aware, till I received last Saturday's *Builder*, that I had been disturbing the even tenour of these exemplary pages by using "bad language"; that I had had the audacity to call some one or something a parallelopipedon, as O'Connell once did an old crone in the Emerald Isle. The language of Truth has always been considered abominable language by conservative Error. In fact, its piercing sharpness has, from time immemorial, been regarded as pestilent "heresy." But for such language there is no occasion to apologise to the editor of the *Builder*. METER.

IMPENDING CALAMITIES.

SIR,—A favourite occupation of mine while walking about in the corners of the old City of London is to watch the old houses, and notice how they stand their years and the changes that modern enterprise has brought about. Railway companies usually choose, where they have a choice, some crazy, ramshackle property, infested with courts and alleys, and demolish them in a summary and satisfactory manner. But how about the property on the edge of their clearings? My remarks at the present time have reference to the neighbourhood of Clifton-street and Sun-street, Finsbury. The property here is for the most part very old, and somewhat tottery. When the end house of a row is taken down, the next two or three mostly shift a little towards the gap, and old houses, like Humpty Dumpty, cannot be set again as they were before. In some of these houses, which look healthy and strong enough outside, I have no doubt the walls are dropping, the ceilings cracking, the windows rattling, and the doors refusing to shut, or being shut, refusing to open. The floors are quite out of level, and whan the trains rush along, or the heavy wagon traffic lumbers past, the houses tremble as though they were going to collapse. These facts I know, partly from trustworthy information, and partly from actual experience, and if some steps are not taken to provide that this property does not fall down, we shall have to chronicle another appalling accident. People live and do their business in these places, and those who depreciate their property and jeopardise their lives ought to be instructed that they have not done everything possible to be done when they build and see to their own premises. That some of these houses are absolutely unsafe I know, and every one of them should be examined by a surveyor at once, before they have time to collapse, and bury their occupants in the ruins. A CITIZEN ON FOOT.

*** A note to the District Surveyor would lead to the required survey.

A WORD TO TRADE UNIONS.

I AM an advocate for men uniting to secure a fair reward for their labour; to assist each other in acquiring knowledge; and, if need be, to resist the oppression of masters who make unreasonable demands upon those they employ; and, if they have it in their power, men ought to aim to secure to themselves the advantages arising from the increase of wealth which become their due. But I am sorry to say that there seems to be a spirit manifesting itself, which shows a want of knowledge of the history of times gone by, and which have been condemned as oppressive times. Of late years tyranny in any form has been regarded as disgraceful, while liberty and equality are professedly sought after. We have passed the time when men were put to death and otherwise punished because they would not conform to the Established Church. The times are passed when tradesmen could not carry on their business unless they belonged to some company. And why? Because men have become wiser, and, therefore, more self-dependent and generous. But I find we are being carried back to bygone days, to days of tyranny and persecution, by means of certain rules of the trade unions. A master employs without distinction a number of men. Some are members of trade societies, others not. For a time they work together amicably, but when it suits their purpose, the unions demand of their members to come out from the employ, unless those who do not belong to their society choose to become members. When I first heard of this rule, I was in conversation with a mason who told me that such was their custom. I felt as if I had been transported to a country of savages, and said to him, "Then that is abominable tyranny." But I now know that it is done, from facts, and I urge upon those who make the rules to rescind such as these, for they disgrace whomsoever become members of the society. Every man has a right to his own opinion, and no man has a right to oppress his fellow. CHARITAS.

YORK MINSTER.

THE work of restoring the exterior of the south transept of the Minster is (according to the *York Herald*) making satisfactory progress, but, owing to the great amount of carving, and the pains taken in its execution, and the fixing of the stone work, it will be some time yet before it is finished. The stone used in the restoration is brought from near Tadcaster, and is known as Jackdaw Cragg stone. Nearly the whole of the Minster is constructed of the same kind of stone, so that in respect to material the new portion of the south transept will be in keeping with the general building. The stone is a magnesian limestone, and some of it is very difficult to work, but it is considered very durable, and thus repays the time and labour which is necessarily expended on it. The quarries from which it is obtained belong to Mr. J. Smith, Tadcaster, and until recently were the property of Lord Londesborough. The east aisle was completed about a year ago, and the west aisle has been proceeded with as far as possible at present. The central aisle of the transept is now undergoing restoration, and it is calculated that it will be completed in about eighteen months. Four new octagonal pinnacles have been added to the east and west aisles. The carving has been entrusted by the architect to Mr. G. Milburn, Stonegate. Mr. G. Bradley is clerk of the works.

Our supposition as to a certain report was correct. Sir E. Beckett, in a letter addressed to the *Herts Advertiser* of the 28th ult., says:—"Let me add a line on a very different subject, or it may be thought that, as I am writing, I acquiesce in a wonderful paragraph which you copied from the *Athenæum* last week, that I have been appointed architect for the further restoration of York Minster instead of Mr. Street. It is a mere piece of nonsense. It oddly happens that the Minster is the only church in that diocese over the alterations of which I have no jurisdiction

as Chancellor thereof. If I had, I should certainly not have allowed the alterations he has made there under his favourite pretence of 'Conservative Restoration.'"

TRAMWAY SLEEPERS.

Sir,—The letter in your impression of the 21st of September, from "F.," is perfectly correct as to the quality of the sleepers used in the construction and repair of some of the London tramways. It is the most defective portion of the whole system,—a grievous evil, and the cause of continual annoyance to the public, by reason of unnecessary opening up of the public way on the company's lines. I have scores of times seen the paving disturbed in order to refix loose metals, and it has in nine cases out of ten been found that the sleepers have rotted, and allowed the dogs (that should hold the metals) to draw from the sleepers, because of the rottenness of the timber; whereas, had they been properly pickled, or hard-wood sleepers, such would not have been the case.

Granite paving, when well rammed on a solid concrete bottom, will remain in good order for a considerable time, and when disturbed for relaying, seldom finds its level with the adjoining paving as well as when first properly laid; but, owing to this false economy in the preparation of the sleepers, the pitching has to be taken up in hundreds of places annually, and the result is the pot-holes that are to be found along the lines of the existing tramways; but still this neglect continues.

The numerous cross-overs with which the tram-roads are provided would be materially lessened if it were compulsory on the company or their contractors to use nothing but good pickled or hard-wood sleepers, as they would not be required were it not for the numerous openings for repairs which defective sleepers are the cause of, thereby rendering it necessary for the cars to be dragged from one line to the other, because their line in consequence of these unnecessary repairs is so frequently impassable.

The attention of the Metropolitan Vestries should be turned seriously to this subject, and no doubt would be if the cost of these repairs were on their shoulders; but as this is not the case their interest seems to cease, because it is only a public inconvenience, and does not touch the pockets of the ratepayers whom they represent.

I speak in this matter from practical experience and not from mere casual observations, and can vouch that the use of "simple yellow deals without any preparation against decay" is the cause of more than half the openings so unnecessarily made in our London tramways.

G. W. B.

SANITARY FITTINGS.

Sir,—With reference to a paragraph in your paper relating to "Paris Exhibitions Awards," I am pleased to be able to inform you the efforts I have made for the improvements of sanitary and other appliances necessary to health and comfort have been again recognised by the jury, who have adjudged me the only silver medal (the higest award) in class 66.

The sanitary arrangement and fittings of the pavilion of H.R.H. the Prince of Wales, and of the offices and private apartments of the Staff of the Royal Commission, were entrusted to me, the whole having, up to this time, given the greatest satisfaction.

As *àpropos* of your recent description of the Palace Hotel, San Francisco, you may not object to my telling you that 550 of my patent valve-closet and trap in one piece were put up there, and I enclose you a copy of a letter received from the manager of the hotel, in reply to an inquiry I sent him, showing the entire satisfaction they have given.

The fact of these closets being so largely used and favourably spoken of in the "States" is also interesting, taken in connexion with your review of an American work on "House Drainage," &c., in another column.

George Jennings.

White Tiles. — We have received from Messrs. W. T. Copeland & Sons some samples of white tiles, very suitable, we think, for internal and external decoration. They are "hand-made," and consequently better able to stand the test of weather. They are glazed, but not disagreeably shiny. The manufactory is at Stoke-upon-Trent, Staffordshire.

A CONCRETE MIXER.

Messrs. Day & Lampard have patented a concrete mixer. It consists of a wrought-iron box, whose transverse section is somewhat in the shape of a cross. To one end of this box is secured a circular plate, with an opening in the middle, through which opening the machine is fed, and the circumference of this plate is turned, forming a roller path, upon which the box rotates on a series of rollers. At the other or open end of the box is a cross whose arms at their ends are bolted to the sides of the box, and in the centre of the cross is fixed a wrought-iron shaft; the other end of this shaft runs in a bearing. The action of the machine, which is simple, is as follows:—

The materials for forming the concrete are fed into a shoot either by hand or by crane,—a sliding door being partially opened; the machine tipped to any desired angle and set in motion; a continuous stream of well-mixed concrete is then turned out, and no stoppage of the machine for either filling or emptying is required from morning till night. Should it be desired to mix concrete in charges, the mixer is filled as before but with the door closed, and when a sufficient number of revolutions have been given, say ten or twelve, the door is slidden back, the machine tipped, and the concrete is discharged in a mass.

The machine is said to be capable of mixing over 100 cubic yards of concrete a day, of a quality superior to the generality of that made by hand.

ROMAN CEMENT.

Sir,—I have just made a fountain with space for flowers in outer edge with Roman cement and part sand: I find it sweating through the pores. As it is made in a conservatory with boarded floor, I think it will soon rot the floor. Are there any means of stopping the pores in the tank without destroying the fish? And will the sweating soon make it fall to pieces?

J. S. S.

"MAY DIFFERENCES OF OPINION NEVER LESSEN FRIENDSHIP."

Sir,—Herewith I send list of tenders for the West Pier Extension, Shoreham, Sussex:—

Goodenough	£8,410	0	0
Marshall	6,000	0	0
Ball & Gammon	4,780	0	0
Hayter	3,760	0	0
Harrison	3,592	6	0
Hill & Co	3,431	0	0

A comparison of the above will be much more instructive than any remarks I can offer.

A Competitor.

WHERE IS THE CITY TEMPLE?

Sir,—In order that there might be no mistake as to the locality of this building, an inscription has been drawn up, and, no doubt, examined and approved by all the proper authorities, cut on a costly marble tablet, and fixed in the vestibule, as is duly recorded in your paper for Sept. 21st. We have, by these means, the evidence of the writer, the marble mason, the authorities aforesaid, and the gentleman who paid the bill, that the City Temple is situate at "the south-western end of Holborn Viaduct," for surely none of these would have lent themselves to a misdirection which might turn the stranger out of his way.

Yet, if the stranger goes thither he will find,—firstly, that the City Temple is nearer to the middle than the end of the Viaduct, between which and it a large church and a row of houses intervene; secondly, that the Viaduct does not in any part of its length run to the south of west, but more or less to the northward. Indeed, at the spot where this building stands it runs (by the map, and as one might suspect from looking at the church) considerably to the north of west, say rather more than W.N.W.

I have never quite believed that the celebrated definition of a crab as "a red fish that walks backwards" was more than a joke. Now, that or any other combination of blunders seems possible. Thos. Blashill.

STREET IMPROVEMENTS IN THE PROVINCES.

Newton Heath.—At a meeting of the Newton Heath Local Board on the 26th ult., a letter was read from the Local Government Board, acknowledging the receipt of the clerk's letter in reference to a proposed loan of 7,500*l.* for works of private street improvements, and stating that before deciding upon the application they would direct a local inquiry to be held by one of their inspectors.

Derby.—A new street, to be called "The Strand," is about to be opened out by Mr. Councillor Woodiwiss, from St. James's-street to Sadler-gate Bridge, and rescued, so to speak, from the site of what was not long ago an uncovered and stinking brook-course. The laying of the memorial stone of the buildings opposite the Post-office, and the naming of the new street, took place on Monday last.

Liverpool.—It has been decided by the Improvement Committee of the Liverpool Town Council to recommend that body to obtain authority to widen a portion of Dale-street, to widen portions of other important streets, and to extend the North Haymarket. The Committee propose to borrow 300,000*l.* from the Local Government Board for the carrying out of these improvements.

Manchester.—It is stated that alterations of an extensive character will shortly be carried out by the Manchester Corporation in Spring-gardens and the neighbourhood. The street will be widened in several places so that there may be a uniform frontage, and arrangements have also been made for the closing of Sickle-street, and the formation of a street leading from Milk-street to Market-street.

DOCKS, HARBOURS, AND PIERS.

Shoreham.—The Shoreham Harbour Trustees met on the 23rd ult., to receive tenders for the works connected with the extension of the western pier. It was reported that six tenders had been received, and these varied from 8,410*l.* to 3,431*l.*, the latter being sent in by W. Hill & Co., of Gosport, which the General Purposes Committee recommended should be accepted. The recommendation was adopted. Mr. A. M. Rendel is the engineer.

Macduff.—On the 27th ult. the new basin of Macduff Harbour, a work which, together with numerous alterations and improvements, has been in progress since January, 1876, was publicly opened. The new basin, which was formerly an outer harbour for boats only, is enclosed by substantial piers, and covers about an acre.

Plymouth.—At a meeting of gentlemen interested in the formation of a new pier at Plymouth, for which a provisional order was obtained last session, it was resolved to build a pier, promenade, and concert-hall, from the Hoe into the Sound, at an estimated cost of 50,000*l.* A portion of the capital was subscribed in the room, and provisional directors appointed to carry out the scheme.

Harwich.—Extensive works are being executed at Ray Island, for the Great Eastern Railway Company, by Mr. Ridley, contractor. Ray Island, hitherto comparatively unknown, would seem destined to be the centre of trade in the district at no distant period, for it is to there, it is said, the traffic of the Great Eastern Railway is to be removed, and it is estimated that the works will be sufficiently far advanced in eighteen months' time to admit of the steamers discharging there. The company's engineers have been engaged at Ray Point in taking soundings for a pier. Perhaps (according to a local paper) the greatest difficulty which has to be overcome is the building of a sluice water-way at this point; and after this has been accomplished the sea-wall will be extended to a point where a junction with the railway will be effected in the neighbourhood of the Dovercourt Cement Works. At the present time there is more than a mile of improvised railroad connected with Ray Point at one end, and with the cutting in the rising ground at the other end. The earth required for the purpose of forming the sea-wall is obtained from this cutting by the "steam navvy," recently described in the *Builder*, and conveyed over the metals in trucks drawn by an ordinary shunting engine. The cutting at its greatest depth will be about 53 ft., so that as only 28 ft. have been dug out at present there is plenty of work to be done. It is not, as some suppose, to be converted into a railway when completed, but into a roadway connected with the dockhouse and Upper Dovercourt. The railway will pass round near the sea-wall, and have a junction with the Harwich branch line near Wrabness. It is expected that it will take three years to complete the undertaking, and the amount of the contract is 10,000*l.* Mr. Abernethy is the engineer, and Mr. Eckert is clerk of the works.

Architecture at University College, London.—The lectures on Architecture and Construction, by Professor T. Hayter Lewis, F.S.A., will commence on October the 8th. There will be two courses as heretofore,—Construction and Fine Art.

SURVEYORSHIP ITEMS.

Gorton.—At the meeting of the Gorton Local Board, on the 26th ult., the resignation of Mr. B. Bell as surveyor to the Board was tendered by that gentleman, owing to ill-health, and accepted; and the salary of a successor was fixed at 250*l.* per annum.

Sunderland.—At a special meeting of the committee appointed by the Sunderland Town Council for the reorganisation of the engineer's department, to consider the applications for the office of out-door superintendent to the Sunderland Corporation, the following twelve were selected for personal interview from seventy-five applicants:—William Naisbet, Felling; William Lawson, Middlesbrough; R. J. F. Carter, Monkwearmouth; John Donkin, Leeds; R. H. Howgood, Carlisle; R. C. Forster, Gateshead; C. H. Holt, Houghton; John Williamson, Gateshead; H. H. Hall, Harrogate; Thomas Alderson, Annfield Plain; R. Stafford, Sunderland; F. E. Thorwald, Ornsly. At a meeting of the Town Council on the 25th ult., the committee presented a report in which they recommended that Mr. Rounthwaite, head draughtsman, be appointed assistant surveyor, at a salary of 150*l.* per annum. The recommendation was agreed to. The committee also recommended that Mr. Thwaites, the Borough Engineer, have authority to appoint a draughtsman in the place of Mr. Rounthwaite at a salary of 120*l.* a year. Mr. Preston proposed that this be passed, and mentioned that a young man had been obtained, and was in the office on three months' trial. Mr. Waddell asked by whose authority the young man was in the office, and by whom would he be paid. Mr. William Bell moved as an amendment that they advertise for a draughtsman for this post. The Council had appointed men by this mode hitherto, it had worked well, and, without saying an unkind word of the engineer, he thought they should engage their servants themselves. After some further discussion, Mr. Bell's amendment to advertise was carried by seventeen to sixteen. It was agreed that Mr. George Humble's (engineer's assistant) salary be increased to 100*l.* a year. The appointment of an out-door superintendent was then proceeded with, the voting being for R. Stafford, twenty-seven; R. H. Howgood, eight. The name of Mr. R. C. Forster was also on the paper, but no votes were recorded for it. Mr. Stafford was therefore elected.

Southend.—At a special meeting on the 20th ult., the Local Board went through the seventy-eight applications for the office of surveyor and inspector of nuisances, and decided that each member should write down six names which he thought best, and it was resolved that the three highest of the selected candidates should attend a subsequent meeting of the Board. Those selected were Mr. Harrington, Rochford, ten votes; Mr. Abron, of Ryde, Isle of Wight, eight votes; Mr. Loch, of Chelmsford, seven votes. The Board met again on the 25th ult., when the voting (by paper) showed the following results:—Mr. Harrington, nine votes; Mr. Abron, two; Mr. Loch, none. It was then resolved that Mr. Harrington be appointed surveyor and inspector of nuisances, at a salary of 150*l.* per annum.

Sevenoaks.—Mr. Pain has resigned his position as assistant surveyor to the Sevenoaks District Highway Board, and Mr. Wood, of Shoreham, has been appointed his successor, at a salary of 100*l.* per annum.

Darlington.—Mr. T. Smith has been appointed surveyor to the Corporation and Urban Sanitary Authority of Darlington.

SCHOOLS OF ART.

Maidstone.—The annual meeting of the Maidstone School of Art was held on the 25th ult., when Sir Sydney Waterlow, M.P., distributed the prizes won by the students during past year. The Rev. H. Collis then read the report, which stated that during the year about 404 drawings had been finished. Three pupils had obtained third-grade, and nine second-grade prizes, and at the Government examination sixteen students obtained eighteen certificates, three of them full ones. Regret was expressed at a falling off in the subscriptions.

Falkirk.—A new Science and Art School for Falkirk was opened on the 21st ult., by the Earl of Rosebery. The new building, which is two stories in height, has been erected in Park-street. It is designed in the Italian style,—its chief features being a pilastered doorway and a balcony with balustrades below a large double-light window on the upper floor. On the left of the lobby is a hall, 45 ft. by 30 ft. by 16 ft., where the elementary art classes will meet. This will give accommodation to from sixty to eighty pupils. The woodwork of the room, as of all the others in the building, is of light pine. The room will be lighted at night by four star-burners depending from the ceiling. On the right of the lobby are two science class-rooms, 24 ft. by 18 ft.; and to the back again is a lavatory and a small house for the janitor. The principal room on the upper floor is about 27 ft. square, and in it the study of the antique will be prosecuted. The ladies' painting-room adjoins, its dimensions being 27 ft. by 16 ft.; and in this flat are also a small modelling-room, an apartment for the head-master, and a class-room. In a wing to the back, to which access is had from the first landing, there is a room, 30 ft. by 21 ft., which is to be furnished as a chemical laboratory, and in which sixteen students can find working-places. Mr. Boucher, of Glasgow, was the architect.

LOCAL GOVERNMENT BOARD INQUIRIES.

Tottenham.—On the 27th ult. Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at the offices of the Tottenham Local Board of Health, with reference to an application made by that body to the Local Government Board to determine what is a reasonable cost at which a proper supply of water may be required to be furnished. It was explained that under the 62nd section of the Public Health Act, 1875, where, on the report of their surveyor, any Local Board came to the conclusion that any house within the district was without a proper supply of water, they could compel the owner or occupier to take a supply from the Board at a charge not exceeding twopence per week for every house so supplied. Application, however, could be made by the local authority to the Local Government Board, to determine what, under all the circumstances of the case, would be a reasonable charge. The Tottenham Board had ascertained that, in one portion of their district alone, eighty-nine houses were not supplied with their water, but obtained their supplies from wells. On complaints that the water in some of these wells was impure and injurious to health, the Board had samples analysed, the result being that the wells were condemned. Inasmuch, however, as the water-rate was 1s. 4d. in the pound per annum, and some of the houses having wells would be charged 2*l.* 2s. for water if calculated in the usual way upon the rateable value of the premises, while only the payment of 8s. 8d. could be enforced if the Board exercised their compulsory powers, they have delayed taking measures for closing all suspicious wells until they could charge more than 2d. per week for a supply. The inspector, after considerable discussion, said there could be no dispute as to pure water being a necessity, and the official analysis showed that the quality of the water supplied by the Tottenham Board stood very high. He did not believe wholesome water could be obtained from shallow wells, and he did not think 2d. per week was a reasonable charge for a proper supply of water. No doubt the Legislature intended to confine that small charge to cottages; but, as the Act stood, no more could be demanded, however large the premises, where Local Boards exercised their compulsory powers, unless the Local Government Board fixed some other charge. It seemed to him to be unfair to the great bulk of the population (who took the water and paid according to the amount of their assessments) to charge less, in certain cases, than was generally paid; but Local Boards had no power to compel the use of their water where a "proper supply" already existed.

Newcastle-on-Tyne.—On the 28th ult. Mr. Arnold Taylor held an inquiry, on behalf of the Local Government Board, into the proposed alteration of a site for the accommodation of 782 persons of the working class, from the area known as "Battle Field," to that known as "Miller's Hill," near the Ouseburn. Mr. Alfred M. Fowler, the borough engineer, gave evidence to the effect that Miller's Hill was the least expensive site, and was quite eligible for the erection of artisans' dwellings to accommodate 782 persons. The site contains 4,719 square yards; 4,070 square yards of the area were the property of the Corporation. The proposed site was about 200 yards from the Quay, and from centre to centre it was about 300 yards. It was 60 ft. above the Quay wall. They were now making a new street on the south side of the plot. This work was actively carried on at present, and if the Local Government Board approved of the scheme they would make the ground level for the erection of artisans' dwellings. Its highest point above the Quay would be about 90 ft. In answer to a question as to the cost of the respective schemes, Mr. Fowler said that 18,300*l.* was to have been the cost of the former one, and 16,650*l.* for the present. At the same time they were going to take down buildings which were not considered to be in a satisfactory condition, and make a new street. Dr. H. E. Armstrong, medical officer of health, testified to the salubrity of the Miller's Hill site, which was afterwards visited by the inspector.

PROPOSED NEW VESTRY-HALLS.

Battersea.—At a meeting of the Battersea Vestry on the 26th ult., it was resolved,—(1) That in consequence of the great increase of parochial work, the approaching expiration of the lease of the Lammas Hall, and the desirability of improved accommodation for the vestry and the various local Boards, it has become necessary that steps should be forthwith taken either for the acquisition of other and more commodious premises, or for the purchase of land on which to erect a new vestry-hall for the parish of Battersea. (2) That the consent of the Local Government Board be applied for to adopt and put into force in Battersea so much of the Act, 13 & 14 Vict., c. 57, as relates to the powers given to vestries for the erection of vestry-halls. It was also resolved to advertise for plans and estimates.

Fulham.—At the meeting of the Fulham District Board of Works on the 25th ult., the committee charged with the matter reported that they had examined the replies to the advertisement for a new site for the Board-room and offices, and that they had inspected the most eligible sites; but they did not see among them one that they could recommend to the Board for the erection of new offices. They therefore advised that the Board should proceed with the erection of a new Board-room, and with certain alterations, at Broadway House, according to the plans and specifications already prepared and approved, and that tenders for carrying out the work be advertised for. The report was adopted.

Limehouse.—Steps are being taken to purchase some property required for the site of the proposed "Town-hall" at Limehouse. ["Town-hall" in this and some other metropolitan instances is simply Vestry-hall "writ large."]

Wandsworth.—The Vestry of Wandsworth has applied to the Local Government Board for permission to borrow 14,000*l.* for the erection of a new vestry-hall and offices. The proposed site is in Wandsworth High-street, and has a frontage of 68 ft., and a depth of 154 ft.; it will cost 2,000*l.*

NEW HALLS FOR FRIENDLY SOCIETIES.

Tunbridge Wells.—The new Friendly Societies' Hall at Tunbridge Wells (the foundation-stone of which was laid fifteen months ago by H.R.H. the Princess Louise) was opened on the 26th ult. The building has a frontage to the Camden-road of about 62 ft., the lower portion being devoted to three shops. The entrance has a porch of Portland and Bath stone, with granite columns on either side supporting elephants' heads, carved by Mr. Handley, of Grove Hill-road. On the ground-floor accommodation is provided for the manager, together with a large room which will be used for lectures, entertainments, club-meetings, &c. In the yard at the back it is proposed to have an American bowling-alley. There is also a large bar for the supply of refreshments. On the first-floor there is a large club-room, 34 ft. by 60 ft. in extent, and running from the front to the back of the property. This room is 21 ft. in height. On this floor there is also a reading-room, a committee-room, lavatory, &c. On the second-floor there are bedrooms and suitable offices for the manager. Messrs. Weeks & Hughes are the architects. The contractor was Mr. Henry Elwig, the sub-contractors being

Mr. Handley, stonemason; Mr. Church, bricklayer; Mr. Harmer, plasterer; Mr. Ryder, plumber, decorator, and painter; and Mr. Simpkins, smith and ironfounder.

Reading.—On the 17th ult. the memorial stone of a new Foresters' hall in West-street, Reading, was laid by Mr. George Palmer, M.P. The building is designed by Messrs. Wm. & J. T. Brown and Albury, architects. The hall is situated on the ground-floor, and about 3 ft. above the level of the street, being approached by an entrance, 7 ft. wide (between two shops which face the street), having a lobby 15 ft. by 14 ft., with lavatories. A pay-office is adjacent, also a staircase leading to a committee-room 30 ft. by 12 ft. on the first floor over the entrance, and there is a balcony to the street front, which is simple in character. The hall itself is 79 ft. long by 38 ft. 3 in. wide, and 27 ft. high, with semicircular apse at the platform end, and will accommodate between 700 and 800 persons; and by the addition of a gallery at the east end 150 more seats may be obtained. Beneath the hall there are a court-room 39 ft. 6 in. by 30 ft. with apse 20 ft. by 12 ft., together accommodating about 300 persons; two committee-rooms, each 30 ft. by 14 ft.; stores, cellars, &c. The total cost will be about 4,500*l.* Mr. W. H. Simonds is the contractor, Messrs. Wright & Shackel having undertaken the smiths' work and gasfittings, and Mr. S. Gocher the painting and glazing.

GAS JOTTINGS.

Laying Mains.—At the thirteenth half-yearly meeting of the West of Scotland Gas Managers' Association, held at Kilmarnock on the 26th ult., Mr. Fairweather, of Barrhead, read a paper upon "Gas Mains," in which he advocated, among other things, that a stone should be placed underneath the joints, so as to secure them from breakage and leakage. A discussion followed, in the course of which it was pointed out that while this system might be advantageous for country districts, where there was no heavy traffic, yet in towns there would be a danger of the pipes giving way between the joints.

Profits at Manchester.—It is stated that the profits of the Gas Department of the Manchester Corporation during the year ended June last amount to 111,594*l.*, against 100,539*l.* in the previous year. Of this sum 15,030*l.* will be appropriated as interest on loans, 27,408*l.* will be transferred to capital account towards the mortgage debt; 51,936*l.* will form the portion of a surplus payable to the improvement department; and 17,111*l.* will be carried to the reserve fund. There has been an increased consumption of gas of nearly 73,000,000 cubic feet, the amount supplied being 2,142,997,000 cubic feet. The borrowed money owing by the Gas Department amounts to 407,028*l.*, and the assets amount to 1,107,593*l.*

DRAINAGE MATTERS.

Brechin.—The local authorities of Brechin having been urged to take steps with a view to the purification of the River Southesk, special meetings of the town council and police commission were held on the 25th ult., to consider the matter. Plans for the drainage of the town have been obtained from Mr. Willett, C.E., but after a good deal of discussion it was decided that a sluice should be put in to the East Mill dam dyke, according to Mr. Willett's plan, and to delay doing anything more for the present.

Hipperholme.—The scheme of sewerage for the district of Hipperholme, Lightcliffe, and Bailiff Bridge, under the Hipperholme Local Board, commenced in June, 1877, is now completed. It is designed on what is known as the dual or separate system, the sewers being constructed to carry the sewage with only a limited portion of the storm or surface water of the district. No. 1 outfall sewer carries the sewage of Lightcliffe, Hill Top, Bramley-lane, and Hipperholme village district; No. 2, that of Bailiff Bridge only; and No. 3, that of the Hipperholme Lane-ends district. The whole of the sewers are provided with manholes and ventilators at each change of gradient and direction; also with down outlets and flushing stations at convenient intervals. The sewage from Hipperholme and Lightcliffe will be treated by a process of filtration in six tanks, in duplicate, situated at Bailiff Bridge. The Bailiff Bridge Sewage will also be dealt with in tanks on the lower portion of the same land. The sewage of Hipperholme Lane-ends will be run in carriers over land in Wood Nook-lane, leased by the Board for irrigation purposes from Major Stocks. The total length of sewers constructed is about 4¼ miles, and cost of works 7,000*l.* The scheme has been carried out from plans, &c., prepared by Mr. Richard Horsfall, Halifax, under the superintendence of Mr. J. P. Wilkinson, as resident engineer; by the following contractors:—Mr. Henry Birkby, Wyke; Messrs. Slater, Brothers, Halifax; Messrs. Shaw & Taylor, Lightcliffe; and Messrs. Robinson, Fielding, & Co., Thornton, Bradford.

MASTERS AND MEN.

Durham.—There being but few new buildings in course of erection in the city of Durham, the trade of the plasterers in that city has become exceedingly dull, and the masters some time ago gave notice of a reduction in wages, amounting to a little over 2s. per week. A small number of the men having refused to accept this reduction they have been out on strike nearly three weeks.

Birmingham.—Messrs. Chance, Brothers, of the Spon-lane Glass Works, have (according to the *Birmingham Gazette*) been reluctantly compelled to call together their workmen engaged in the manufacture of sheet glass, and to announce their intention of making a reduction in wages. This step has been rendered necessary by the increasing foreign competition, and other circumstances. The usual notices of reduction have been issued.

"WATER AND WATER-SUPPLY."

Sir,—In the notice you have given in the *Builder* of my recently-published work on "Water and Water-Supply," there are some statements and imputations concerning which I beg to submit a few words in reply. Of course I have nothing to say to the general criticism and the conclusion to which your critic arrives, that "what is new is not true, and what is true is not new."

The hydrographic division adopted claims no other merit than that it is convenient and comprehensive. It was adopted by me after some consideration, and was not only in type, but printed, some time before the conference at the house of the Society of Arts was summoned.

I need hardly say that the Welsh coast drainage is in no way mixed up with that of the Severn drainage, either in my mind or my book. The Dee certainly is not an affluent of the Severn.

The maps given were not copied either directly or indirectly from any bearing Mr. Symons's name, either in the Transactions of the Institution of Surveyors or in the Sixth Report. For the outlines of the British Islands map I am indebted to a German source, and for the outline of the maps of the various drainage areas I made use of a map published long ago by Mr. Petermann. For the filling up of the outlines I am responsible, and though aware that there are errors, I think the object I had in view is attained. For the detailed accounts of the rivers I am largely indebted to the Ordnance map.

I have not, so far as I am aware, quoted Mr. Symons without acknowledgment, and though making use of his tables, have by no means adopted them exclusively. Where it was possible I have taken Mr. Glaisher's figures.

To both these observers I have, I think, acknowledged the obligations due for their exertions in recording rainfall.

The experiments by Dr. Tidy on oxidation of sewage were not in a sufficiently advanced state to allow of further notice when the last sheets of my work were in the press. The nature of the experiments recorded is, I think, clear from Dr. Tidy's note given in the text.

D. T. Ansted.

Dry Rot, according to the *Kilburn Times*, has appeared in the new part of the parish church at Willesden. When it was discovered by the churchwardens, the flooring underwent a careful examination, and in one part a fungus, about 2 ft. by 3 ft., was found. The flooring was so affected that it threatened the safety of the organ gallery, and to avoid mischief in this quarter it has been found necessary to substitute iron pillars for the wooden supports.

ORGANS.

Plymouth.—The new organ which has been erected in the Guildhall, Plymouth, by Messrs. Willis, of London, at a cost of 5,000*l.*, is to be inaugurated on October 16, when Dr. Stainer, of St. Paul's Cathedral, will give some recitals.

London.—During the long vacation (says the *Law Times*), the fine organ in the Temple Church, which had suffered considerable damage in the early spring by the severity of the then prevailing storms of rain, has been undergoing reconstruction, enlargement, and thorough renovation, at the hands of Messrs. Foster & Andrews, of Hull. These improvements are fast progressing towards a state of completion. The instrument has received an accession of new sound-boards, numerous local wind reservoirs, three sets of pneumatics, and an entirely new fourth manual or solo organ; while the old and valuable original pipes have been most carefully repaired and restored, and their mellow and sweet tone strictly maintained. The several systems of mechanism throughout the organ have also been entirely renewed. The organist, Mr. E. J. Hopkins, has written a new service, consisting of a "Te Deum" and "Benedictus," for the occasion of the re-opening of the organ on the first Sunday in Term, November 3.

Sheffield.—The alterations to the parish church, Sheffield, have necessitated the enlargement and rebuilding of the organ, and the work has been carried out by Messrs. Brindley & Foster. The instrument was heard for the first time in its new form on Sunday last. The screens separating the chancel and nave have been removed. The transept gallery has been removed, a portion of the north gallery taken away, and the organ replaced in the north transept. It has been so rebuilt as to leave the tower pillars clear, and not to intercept the view, as was the case before, from the body of the church into the chancel. The front of the organ has been rebuilt in accordance with a Gothic design, furnished by Mr. Flockton. The case-work is of wainscot oak, stained to match the old oak work in the church. The organ has forty-seven stops and three complete manuals, CC to A, fifty-eight notes, and an independent pedal organ, CCC to F, thirty notes. The instrument contains 2,566 pipes; the whole of the front pipes (many of which form the 16-ft. double-open diapason on the great manual) being of the finest quality of burnished "spotted metal" without ornamentation of any kind. The instrument is supplied with wind by two bellows blown by three-throw cranks and two fly-wheels. The stops draw diagonally, and the great composition pedals control also the pedal organ. The pneumatic action is applied to both great and swell manuals, and also to the composition pedals. The organ has been rebuilt under the superintendence of the organist, Mr. T. Tallis Trimnell, Mus. Bac. The cost of its enlargement is about 1,500*l.*

NEW ALTARS AND REREDOSES.

Chester.—A new altar at St. Francis's (R.C.) Church, Chester, has just been dedicated. It is of Stourton stone, supported on red marble shafts and carved capitals, at the back of which is the super-altar. The tabernacle stands in the centre, encased in polished red marble, with enamelled door, bearing the characters "I.H.S." On either side of the tabernacle are two panels of inlaid marble, in the centre of each of which is a shield bearing the monograms of the donor (Mr. J. B. Topham) and his wife. A richly carved cornice, running the entire length of the altar, finishes this part. Immediately above the tabernacle is a niche, which contains the statue of the Virgin and Child, and above it is a canopy, supported on polished marble shafts, with delicately carved capitals. This is terminated by a spire rising to a height of 17 ft. In front of the statue the crucifix rests on a corbel. On either side of the canopy are three compartments, containing statues of the apostles St. Peter and St. Paul. The remaining four compartments are filled with foliage. The builder of the altar is Mr. John A. Hanley, architectural sculptor, Chester.

Weobley.—On the 16th ult. a new reredos for the parish church of St. Mary, Weobley, was dedicated. It is the gift of Mrs. Peploe, of Garnstone Castle, and has been designed by Mr. Gambier Parry and executed by Mr. Boulton, of Cheltenham. It is of alabaster, white and coloured, with a cross in the centre, flanked by

two kneeling angels. There are also four infant heads, two on each side, and the Alpha and Omega. The altar-cloth was furnished by Messrs. Jones & Willis, of Birmingham.

Scarborough.—The Roman Catholic Church at Scarborough has just received an addition in the shape of an altar and reredos for the lady-chapel. The stonework has been executed by Mr. Earp, of London, and the gates by Messrs. Hart, Son, Peard, & Co., of London, both after designs by Mr. George Goldie, architect.

Galway.—On the 22nd ult., the new altar for the Jesuit Church of St. Ignatius, Galway, was consecrated. The work has been designed by Mr. William Hague, architect. The whole superstructure of the altar is composed of marbles of varied colours, all the Irish marbles available being introduced. The design embraces the altar proper, with flanking wings, reredos, and canopied arcading, tabernacle, expositorium, and tall spire in two stages, terminating in a floral cross. The general structure is of white Italian marble, with deeply-moulded and recessed panels and niches, enriched with foliation and carved and sculptured figures of saints. The front panel of the altar contains the subject of the "Pieta," sculptured in statuary marble on a large scale.

Banagher.—A new high altar has been consecrated at St. Renagh's (R.C.) Church, Banagher. The altar, which is the gift of Sir George Penrose, of Cork, is a combination of red Cork and Sicilian marbles, richly carved. The side altars are the gift of Mr. James Nevin. The communion rails are of wrought iron, representing a vine branch, and surmounted with stained pitch-pine coping. The stained-glass windows are by Mayer, of Munich, the donor being Mr. William Hannon, Banagher. Mr. Hague, Dublin, is the architect.

York Minster.— The framework of a new reredos in English oak, from the designs of Mr. Street, has lately been placed in York Minster, at the expense of the Dean. It contains some rich and delicate carving. The whole work partakes somewhat of the nature of a tryptich, inasmuch as the side panels or wings are fitted with hinges, and can be folded upon the centre and locked. When completed there will be nine groups enclosed in as many panels. The central one is in progress at Messrs. Doulton's establishment, Lambeth, by Mr. Tinworth, as was mentioned by us a few weeks ago on the occasion of the visit of the Society of Engineers to that establishment. It consists of one panel about 9 ft. in length, the base of which will be at the height of 8 ft. from the footpiece. It depicts the scene upon Mount Calvary at the third hour.

Athlone.—A new altar has just been consecrated in St. Mary's Church, Athlone. It is the work of Signor Leonardi, of Rome, and is a combination of fourteen different kinds of marble. The altar-steps and rails were erected by O'Neill, of Dublin, and the encaustic tiling inside the sanctuary is by Messrs. Craven, Dunnill, & Co.

CHURCH-BUILDING NEWS.

Guyhirn.—The new church of St. Mary, at Guyhirn, near Wisbech, erected from the designs of the late Sir Gilbert Scott, was consecrated on Tuesday, the 24th ult., by the Bishop of Ely. The church, which is cruciform on plan, is in the Early English style, having a lofty nave and chancel, with transepts, and is built of white Whittlesey bricks and Ancaster stone. The floors are laid with Godwin's encaustic tiles. The benches of the nave are of pitch-pine; the stalls and other fittings of the chancel are of oak. There is a massive oak porch at the south entrance, and a lofty bell-turret at the west end, with three bells, the whole forming an appropriate village church. The contractor for the works is Mr. Wm. Girling, of Wisbech, under the superintendence of Mr. Geo. Hannaford.

Bristol.—On the 26th ult. the Mayor of Bristol laid the foundation-stone of a new church at Clifton-wood, which is intended to supplant the structure at present dedicated to St. Peter. The site, which has been purchased from the Society of Merchant Venturers, is almost close to the old church, which, when the new building is completed, will be used for school purposes. The dimensions of the church are to be as follow:—Nave, 39 ft. 7 in. by 83 ft. 1½ in. long; the aisle or side next the road, 65 ft. 8 in. long and 13 ft. 8 in. wide; aisle on the west side, back from the road, 31 ft. 1½ in. long and 13 ft. 8 in. wide; the tower, on the side next the road, about 20 ft. square at the base, and the height from the ground to the top of the spire will be about 150 ft. or 160 ft. The chancel will have a semicircular end, and will be 30 ft. 6 in. long and 27 ft. wide. There will also be a small chapel on the side next the road, so as to utilise as much of the ground as possible, and thereby increase the accommodation. The size of the chapel will be about 13 ft. 6 in. wide and 22 ft. long. The church will accommodate 900 or 1,000 persons. The style adopted is Early Gothic. There will be one low gallery, approached by a staircase in the tower. The architects are Messrs. F. W. Voysey and F. W. Wills, and the work of putting in the foundations has been entrusted to Mr. E. J. Hatherley, of Stoke's-croft. The cost of the building is estimated at about 8,000*l.*

Woking.—St. John's Church, near Knaphill, Woking, is being enlarged by the addition of an aisle. It is intended to add a second aisle when funds are available. Messrs. Welman & Street, of Godalming, are the architects.

Studley Royal.—The new church which has been erected at Studley Royal by the munificence of the Marchioness of Ripon for the villages of Aldfield and Studley Royal, was consecrated on the 23rd ult. by the Bishop of Ripon. The church, which is dedicated to the Virgin Mary, is situated at the upper end of the Park Avenue, midway between the two villages named, and forms a conspicuous object along the road from Ripon. It is in the thirteenth-century style of architecture, from designs by Mr. W. Burges, of London. It consists of a nave, with aisles, chancel, and inner chancel, vestry, and west tower and spire, 152 ft. in height, and is built of stone obtained from quarries on the estate. The interior of the building contains a good deal of sculptured work by Mr. T. Nicholls, including the tracery of the west window, which represents the root of Jesse and the ancestors of our Lord, the reclining figure of Jesse being on the sill of the window. On the corbels supporting the vaulting ribs of the tower are carved representations of the beasts of Daniel. The stained glass in the window contains eight familiar scenes from the life of the Virgin, whose figure occupies a central position in the upper tracery. The nave is divided from the aisles by an arcade of four bays on each side, supported by cylindrical columns, enriched with black marble shafts and carved caps. The division of each bay is marked by a black marble column projected from the clearstory, and these spring from carved corbels and are carried up to the roof principals. The whole of the stained glass work has been done by Messrs. Saunders & Co., London, from cartoons prepared by Mr. F. Weeks. The principal feature of the interior is the chancel. The choir-stalls are of Spanish walnut, carved, and in the north aisle, occupying the second bay from the east end of the nave, is a fine two-manual organ, by Mr. Lewis, of London. The church will accommodate 400 persons, and has cost about 15,000*l.*

Longham.—On the 19th ult. the parish church of Longham was re-opened, after restoration. The unsightly painted deal boxes have been removed, and pitch-pine sittings fixed in their stead. These latter were designed by Mr. Dunt, of Witchingham, and executed under his superintendence by Mr. Brown, builder, of the same place. The pulpit, desk, and lectern, which are of oak, were designed and carved by Mr. Chapman, of Hanworth. The pulpit is the gift of Miss Hastings, and is erected in memory of her father.

New Radford.—On the 26th ult. a new organ-chamber, which has recently been built on the south side of the chancel of New Radford Church, Notts, was opened. The organ formerly stood in the gallery at the west end of the church. The expense incurred by the alteration has been about 270*l.* The builders were Messrs. Fish & Son, the plans being furnished by Mr. R. C. Sutton, architect. The organ itself has been rebuilt by Messrs. Walker & Sons, of London.

Ottery St. Mary.—On the 15th ult. the south tower transept of the well-known Church of Ottery St. Mary was reopened, after being embellished by Lord Coleridge as a memorial to his parents and to the late Lady Coleridge. Previously to certain alterations in the church a quarter of a century ago, the south tower transept was occupied by two large galleries, and it was also used as a belfry. Since then it has been filled and blocked completely by a large organ. This organ has been removed and fixed in the north chancel aisle. The erection of two additional screens being necessitated,—one portion to screen the organ, and the other to correspond,—this has been done by Lord Coleridge. They are of oak, and are being coloured and gilt. The transept rendered vacant now affords accommodation for about fifty people. The new floor is of oak, tiled in the passages. The seats are of oak and walnut, with carved ends. There is a large clock gallery, with a clock like that of Exeter Cathedral, coeval with the church and tower. This has been renovated, and the clock-works, which have temporarily been removed, will be replaced. The oak work has been done by Mr. Digby, of Ottery. The whole of the walls of the transept have been covered with mosaic tesserœ, of different colours, in which dull grey and red prevail, by Simpson, of St. Martin's-lane, London, from the designs of Mr. Butterfield, architect, who has carried out all the improvements. In the place of the nine plain glass windows there have been substituted windows of stained glass, thirteen lights in all, by Mr. Alexander Gibbs. The central figure in the five-light east window represents our Saviour, and the other lights contain the Evangelists. The Bishop of Oxford, Mrs. Mackarness, and Miss Coleridge gave three of the windows, which represent St. Paul, St. Matthew, and St. John. All the others are the gift of Lord Coleridge. The roof has been painted to correspond with the tints of the walls. The cost of the improvements will exceed 2,000*l.* Beneath the east window there is a marble slab, on which will be placed a recumbent statue of Lady Coleridge, from the studio of Theed.

DISSENTING CHURCH-BUILDING NEWS.

Liverpool.—A new Welsh Presbyterian chapel for the South-end, Liverpool, has been opened recently. The new chapel is situated on the north side of David-street, Park-road, on the site of the Old Pine Apple Inn. The shape is cruciform, with nave and transepts, the extreme length of the building inside being 51 ft., width of nave 33 ft., length across transepts 49 ft., transepts 17 ft. wide. There is also an end gallery over entrances, seat-room being provided for 450 worshippers. The style adopted is Geometrical Gothic, carried out in brick with red stone dressings. The work was designed and carried out under the superintendence of Mr. Richard Owens, architect, by Messrs. Nicholson & Ayre, contractors. The cost of the building is about 2,500*l.*——A new Wesleyan chapel in High Park-street, Toxteth Park, was opened on the 27th ult. The building will accommodate from 800 to 850 persons, and there are new schools attached to it which will hold nearly the same number of children. The style adopted is Gothic, the material used externally in construction consisting of selected grey bricks, with bands and arches of red and black bricks, white Stourton stone, and a little granite. A light spirelet rises at one angle to a height of 80 ft. The cost to which the committee limited the architect (Mr. C. O. Ellison), exclusive of heating, lighting, &c., was 6,000*l.*, and the contract was let about a year ago to Mr. A. Bleakley, builder, of Birkenhead, for 6,070*l.*

Henley.—The memorial stone of the new "Tabernacle" at Henley was laid on the 20th ult. The building occupies a prominent position in the Market-place, and is intended to accommodate 300 persons. The material is red and grey brick, with stone dressings to windows. A class-room and school-room form part of the undertaking. Mr. Clements, of Henley, is the contractor.

Stretford.—A new chapel was opened at Stretford, on the 22nd ult., by the Primitive Methodists. It is situated in King-street, and is designed to accommodate 500 worshippers. The school-room, which was opened a few weeks ago, will accommodate 360 scholars. The contract was let to Mr. R. Gell, of Stretford, for 4,400*l.*, but, with the chapel-keeper's house, &c., the entire cost will be 5,000*l.* The works were carried out from the designs and under the superintendence of Mr. Arthur Moray, architect, Manchester.

Statue of Mr. Robert Raikes.—Mr. Brock, of Osnaburgh-street, Regent's Park, has been commissioned to execute a statue of Mr. Robert Raikes, the founder of Sunday schools. The statue will, it is believed, when completed, be erected on the Thames Embankment.

LIVERPOOL ARCHITECTURAL SOCIETY.

The thirty-first session of this society was inaugurated on Wednesday evening, when the president, Mr. Henry Summers, delivered an address, in the course of which he said the Society was composed of 48 fellows, 13 professional associates, 35 associates, 24 students, and 3 honorary members, showing a total of 123. He referred to the recent conference of architects in London, at which the Society was ably represented by Mr. Boult. Mention was made of the various business and other premises in course of erection in Liverpool, and of the approaching opening of the Picton Reading-room, which would form an important addition to the public buildings of the town; while the completion of the Art Gallery and Steble Fountain would afford ample matter for future architectural criticism. Mr. Summers suggested the erection of some handsome public building on the west side of the space in front of the Art Gallery, and touched upon the subject of the Liverpool water supply. He hoped the cathedral which was proposed to be erected in their midst would be one worthy of the town. He next criticised, from a professional point of view, Mr. Broadhurst's speeches at the Trade Unions Congress at Bristol, and said the great evil of unionism, which was correct in principle, was its levelling all distinction between skilful and unskilful workmen.

Mr. Picton proposed, and Mr. Boult seconded, a cordial vote of thanks to the chairman, which was carried.

OBITUARY.

Sir Richard Griffith. — Sir Richard John Griffith, bart., who died on the 23rd ult., at Dublin, attained the age of 94, and had been for sixty-nine years a public officer. He entered the service of the State in 1809, having been then appointed to inquire into the best means of draining and improving the Irish bogs. In 1812 he was elected Professor of Geology and Mining Engineer to the Royal Dublin Society. He soon after began his geological map of the country. In 1822 he laid out a great many new roads. In 1824 he was selected by the Marquis of Wellesley for what was called the perambulation or boundary survey of Ireland, which prepared for the Ordnance Survey. In 1826, Mr. Henry Goulbourn being Chief Secretary, he was chosen to prepare a Bill for the general valuation of Ireland. In 1868 he retired from the post of Commissioner of Valuation. Till the time of his death he was one of the Commissioners of the Board of Works. He was buried on the 26th ult. in Mount Jerome Cemetery.

Mr. John Penn, C.E., F.R.S.—Mr. John Penn, principal of the renowned firm of John Penn & Sons, marine engineers, Greenwich, died on the 23rd ult., at his residence, Lee, Kent. He was in his 73rd year. It is stated that Mr. Penn's various improvements in marine engines were thought so highly of by the Admiralty, that no fewer than 740 British war-vessels were fitted with his machinery. Under his management the works at Greenwich and Deptford continually extended, until they at present give employment to over 2,000 men. He was a past-president of the Institute of Mechanical Engineers.

THEATRES.

Cambridge.—The *Cambridge Chronicle* states that it is proposed to convert the Old Corn Exchange of that city into a theatre, capable of accommodating as large an audience as that of the old theatre.

Edinburgh.—It is stated that the building so long known as the Operetta-house, Waterloo-place, is to be converted into a large dining-hall, according to plans prepared by Messrs. Paterson & Son, for Mr. John Grieve. The work has been contracted for by Messrs. Wm. Beattie & Sons, builders.

Glasgow.—At a meeting recently held in Glasgow it was resolved to erect an opera-house and aquarium close to the New Public Halls in the west end of that city. A company has been formed to raise a capital of 80,000*l.* in 10*l.* shares.

Blackburn.—Early on Monday morning the Star Theatre, at Blackburn, was burned down. The theatre was a wooden structure capable of seating 4,000 persons, and had been erected at a cost of 3,000*l.* On Sunday evening "Revival" services had been held in the theatre.

ACCIDENTS.

Blackwall.—A shocking accident has occurred at some new works which are in progress on the Midland Railway Company's premises at Blackwall. A man named William Guttridge, a mason, fell off the stage on which he was at work, a distance of about 40 ft., and was killed.

Dalston.—An inquest has been held at Dalston touching the death of James Glenister, aged 83, a bricklayer, residing in Mildmay-street, Ballspond. Deceased was engaged in repairing the roof of the house attached to his own. When ascending the ladder he slipped and fell to the bottom, a distance of 20 ft. He died three hours afterwards, from fracture of the skull. Verdict, "Accidental death."

Oldham.—A lamentable accident has happened at Higginshaw Gasworks, belonging to the Oldham Corporation. A chimney there is nearly completed, all but the top part being finished. Two men, named George Livesey and Patrick O'Connor, were being wound up in a hoppet by means of a crane. They were inside the chimney, and when they were near the scaffolding at the top the rope broke, and the men fell to the bottom of the shaft, a distance of nearly 60 yards. They were both killed.

RATTENING.

Sir,—On Wednesday night last, the 2nd inst., my Stone Saw Mills, Archer-street, Vauxhall, were entered by some person or persons, and five of the machine-bands which drive the machinery in the turning-shop cut up into pieces about 6 in. and 9 in. long. Of course the case is in the hands of the police, and I have every reason to think I shall bring it home to the parties who did this cowardly action.

Andrew Perriman.

*** It is to be hoped so. Every man who can should assist in bringing the scoundrels to justice.

VARIORUM.

A new edition has been published of "The Transfer of Gas Works to Local Authorities," by Arthur Silverthorne, engineer (Lockwood & Co.). It contains valuable statistics and analyses of the results of working under Municipal Management.——The October number of *Science for All* gives particulars which will instruct some of our readers as to "Slate and Shale":—"Ordinary slate, like shale, is hardened mud, and there is no doubt whatever that it was originally formed in the same way, namely, as a deposit of fine clayey ooze accumulated at the bottom of the sea. There is no doubt whatever of this, but the proofs of it do not lie at the surface, and are, therefore, not very easily recognised. If, however, you take a piece of Scottish or Welsh slate, or, better still, if you go to a slate-quarry and look at the rock upon a large scale, you will be able to see that slate is composed of alternating layers of mud of different thicknesses and different grain. Very often, also, there is a difference of colour in these different layers, giving rise to what is called the "stripe" of the slate. That these differently-grained and differently-coloured layers represent the original layers of mud, as successively deposited on the ocean bed, is proved to conclusiveness by the fact that very often—in some slates, at any rate, — you may find lines of shells or other fossils running along these layers and corresponding with them. So far, then, slate and shale agree with one another, and this is sufficient to prove that they are essentially the same, and that they were originally formed in the same way. At this point, however, we have to face a difficulty, which appears to be almost an insuperable one, and in which lies the fundamental distinction between slate and shale. If we look at our piece of shale, we see at once that the differently-grained and differently-coloured layers of which it is composed are all *parallel with the flat surfaces of the fragment* which we are examining. It is along the line of these layers that the shale splits if we apply force to it; and if any shells or other fossils are present in the fragment, they are found in layers which are also parallel to its upper and lower surfaces. On the other hand, in a piece of slate we find all this reversed. We find the same alternating *laminæ* of varying grain and colour; we sometimes even find the same layers of fossils; but all these now *run at some angle, often at right angles to the flat surfaces of the slate.* The slate no longer splits along these alternating layers; in fact, it usually strongly resists violence applied to it in a direction correspond. ing with these; but it will now split almost indefinitely in a direction which cuts these layers at a greater or less angle. This singular difference in the behaviour and structure of slate as compared with shale is its distinguishing peculiarity."——From "Great Industries of Great Britain" for October, we get the following as to masters and men:—"The unparalleled success of nearly all departments of English manufacture which culminated in 1872 has not been altogether advantageous to the country. The working classes, —who on the whole certainly obtained no more than their fair share of the exceptional profits on the transactions of that time,—can hardly be blamed for stoutly and sullenly objecting to the reductions of wages since insisted on by their employers. How much justice there is in their complaints, and, on the other hand, what warrant the employers have for asserting that their businesses cannot be carried on without the prescribed reductions, it would be out of place to discuss here. It is only too evident, however, that the disputes between masters and men,—which have become far too plentiful,—are very disastrous to the country. It is also evident that, in demanding higher wages than are given for the same amount of labour in foreign workshops, the English artisans threaten seriously to embarrass the prospects of our trade. Belgium is not the only country that is now competing with England in some of the trading occupations in which it formerly excelled; but the remarks of Mr. Lumley, one of our Secretaries of Legation at Brussels, in his report on the commerce and industries of Belgium, dated January, 1878, fairly illustrate the usual opinion of the capitalist classes as to the present state of affairs. After pointing out other circumstances that have saved Belgian iron manufacturers from the actual ruin that has befallen some of their English rivals, Mr. Lumley attaches special importance to the lowness of the wage rate for which they have to provide. "Wages of skilled labour," he says, "which in 1872 stood at 11 francs, had fallen in 1876 to 5 francs, and are now standing at 4 francs. At 4 francs, or 3s. 4d. a day, it is difficult for an English workman to live and support a wife and family; but business will never flourish unless masters can find a sufficient inducement to invest capital. This the Belgian workmen, with their better education, have the good sense to see, and, as a rule, they accept work at such rates as they can obtain. It must be borne in mind, too, that the Belgian workman's day is of twelve hours. He works from six in the morning till six in the evening, time being given for meals, and he works six days a week. There is thus a saving on every element that enters into the cost of production; and the Belgian manufacturer is enabled to buy pig-iron in England, pay for freight, and deliver that same iron manufactured into beams and girders in the most central parts of England, or even in the heart of the iron districts, at a lower price than it can be made for by English firms on the spot."

Miscellanea.

Liverpool.—The new buildings for the Liverpool *Daily Post* and the *Weekly Post*, now in process of erection, are situate in Victoria-street, and, it is believed, occupy a larger space of ground than any other newspaper office in England. The new premises are being built after the designs of the Messrs. E. & H. Shelmerdine, architects, Liverpool. Mr. John H. Addison, with a desire to benefit and secure the health of the large number of *employés* under his control, has resolved that the building shall be illuminated by the electric light, and gas will in a great measure be dispensed with. In the composing and editorial rooms the electric light will be used.

Jarrow Fever Hospital Competition.—Discussion is going on in the Jarrow papers as to the way in which this competition was conducted. It is alleged that a prominent member of the Town Council so far forgot his position as to be in direct communication with the author of the design placed second by the committee while it was in preparation; and, during the adjudication, to urge its acceptance. In the course of the communication referred to, it is alleged that certain exclusive information was supplied to the competitor, thus giving him an undue advantage over his rivals.

Trees in Tombs and Churches.—The appearance of the ash or other trees within the space of enclosed graves is no uncommon occurrence. In Perivale Churchyard there is an altar-tomb, surrounded by an iron railing, within which several self-grown trees had got, and quite embowered the tomb with a dense growth of verdure. Three of the trees were ash, hawthorn, and elder. In a churchyard near Worcester a nature-planted ash-tree sprang up within the railings of a lady's tomb,—likely enough, in time, to displace both tomb and railing. A hawthorn and a sycamore were, some five years ago, to be seen within the railing of a tomb in Conway Churchyard. These are not trees planted by sorrowing relatives; for such use weeping willows and evergreens, which do not thrive so well as nature-planted trees. The ash, from having winged seeds, is most likely to get into neglected spots, and will even mount upon old pollard willows. Occasionally trees get within churches, as at Ross, Herefordshire, where the stolons of a felled elm in the churchyard have forced their way within the sacred structure, and now embower a pew; and in Kempsey Church, near Worcester, in a recess of the north wall, is the recumbent effigy of a knight in armour, which is shadowed by a horse-chestnut, in full foliage. In Finchley Churchyard there are two trees, or, rather, bushes, which grow out of enclosed tombs. The stems of both appear to spring from mere crevices between the bricks, which have been very slightly displaced.—*Timber Trades Journal.*

Yorkshire Fine Art and Industrial Exhibition.—It is proposed to erect, in York, permanent buildings specially adapted for the reception and exhibition of paintings and works of art, and also for the accommodation of a technical museum and of the York School of Art, the whole forming the nucleus of a Yorkshire Art Institution. To inaugurate this scheme, it is proposed to hold a general exhibition, similar in character to that of 1866, for which accommodation is to be provided in buildings erected for the purpose on the site. In order to raise the funds to carry out the object contemplated, a loan fund has been established, consisting of sums of not less than 10*l.*, to be advanced as required, for the purchase of site and on account of buildings; the amount so advanced to bear interest at 5 per cent., to be paid off by drawings, dividends, or otherwise, out of the profits, as they arise and are available for the purpose. Already upwards of 14,000*l.* have been promised in subscriptions and donations. The exhibition will be held between the 1st of May and the 31st of October, 1879.

Fires.—On Tuesday evening a serious fire occurred on the newly-erected premises of Messrs. Pellatt & Co., glass manufacturers, St. Bride's-street, Ludgate-circus. While the firemen were engaged in endeavouring to subdue the flames, portions of the stonework fell to the ground, without, however, doing damage to life or limb. Thanks to a substantial party-wall, the adjoining premises of Messrs. Macintosh, India-rubber manufacturers, together with their large store of inflammable goods, were saved. On the same evening fires occurred on the premises of Mr. Norris, cabinetmaker, St. Allder's-buildings, Bethnal-green. On Wednesday, shortly after eight p.m., a fire occurred on the premises of Messrs. Crabb & Co., builders, Kingsland-road. Several workshops and a private residence at the back of the premises were entirely gutted. A large stock of timber was almost entirely destroyed. The origin of the fire is unknown.

Church Building in Manchester.—The Bishop of Manchester has consecrated a new church, dedicated to St. Clement, at Salford, at the sole cost of Lord Egerton of Tatton, who has likewise built a parsonage and provided an endowment. All the seats are free. The church, which is a building in the Decorated style, is in length 108 ft., and its width is 51 ft. The Bishop expressed the deep sympathy which he was sure was felt by all at the absence of the founder, caused by the severest possible domestic affliction. As an advocate of the free and open church movement, his lordship rejoiced that the new church contained no rented sittings. The first bishop of Manchester, he observed, had consecrated 130 churches, of which only nineteen were free and open. He himself had consecrated sixty-six churches, of which twenty-nine were entirely free, while considerable portions of many others were so likewise.

Sebastopol.—Vice-Consul Moffat, in his report on the commerce of Sebastopol for the year 1877, says:—"The town of Sebastopol is almost in the same state of ruin as twenty years ago. Of late years some few new buildings have been erected, as the railway-station, the custom-house, and five corn magazines, each capable of holding 8,000 chetwerts. These are handsome stone buildings. Two fine cathedrals are in course of construction, one in the town and the other at the Khersonese. The streets are not lighted. There is no pavement deserving the name. In spite of the exceptional advantage that Sebastopol enjoys in the procurability of stone on the spot, the streets are almost as bad as those of any town in the midst of the steppe. The population is about 12,000. In winter the temperature is very variable. On one day in December the weather may be that of an English June, and on the next a north wind may bring many degrees of frost. The water is often bad, and sanitary arrangements leave much to be desired. There is said to be more fever in Sebastopol than in any other Crimean town. The past year being the first after their general restoration, the British cemeteries are in a fair state of preservation. Time and money are both required to ameliorate their present bare and dreary appearance. There are, besides isolated crosses and obelisks, thirteen cemeteries, some of them five miles distant from the cottage built for the guardian in charge."

Contractors' Claim for Extra Works.—A claim amounting to upwards of 10,000*l.* has been made upon the Corporation of Hythe by Messrs. Lucas & Aird, the contractors for the main drainage of the town. The contract for the construction of the main sewers was taken by Messrs. Lucas & Aird for 7,000*l.*, and it was further agreed that 250*l.* more should be paid for certain extra work. The contractors have been paid the 7,000*l.*, and the Council are ready to pay over the remaining 250*l.*; but Messrs. Lucas & Aird say that a vast amount of pumping and excavation beyond their calculations was found to be necessary in order to make a sound, complete job of the drainage, and they furnish the items, which amount in the aggregate to about 17,700*l.*, and say they consider they have a claim upon the Corporation for the difference between that sum and the total of the payments on account. A special meeting of the Town Council was held on the 25th ult., at which it was remarked that had the contract turned out favourably instead of adversely, Messrs. Lucas & Aird would not have entertained the idea of making a monetary concession to the town. Further, while it was admitted that the work had been admirably performed, it was said the great cost of pumping had been incurred through the drain having been commenced at the wrong end, the contractors instead of beginning at the outfall having begun at the farthest point from it, so that they lost the advantage of having the sewer to carry the water off as it was constructed. The Council instructed the Town Clerk to inform the contractors that they had no power to entertain the claim.

Illicit Commissions.—Serious allegations are made in the Scotch papers against Mr. Deas, the engineer to the Clyde Trustees. He is charged with carrying on practice on his own private account, after giving an undertaking not to do so, and with receiving commissions from contractors. At a meeting of the Seventh Ward Committee, Glasgow, held on the 27th ult., Mr. Andrew Paton, convener, in the chair, the following motion was unanimously agreed to:—

"That the committee feels strongly that the good name of Glasgow is involved, and hopes that the Clyde Trustees will shrink from no step that may be called for, and that their decision, whatever it be, will be accompanied by a full statement of the facts."

TENDERS

For alterations and new shop-front and fittings, at 349, Edgware-road, for Mr. R. Chapman. Mr. Horace Gundry, architect:—

Hook & Oldrey	£1,090 0 0
Thomas & Butland	967 0 0
Atkins	964 0 0
Aitchison & Walker	962 0 0
Lamble	939 0 0
Bowles	928 0 0
Temple, Bray, & Foster	905 0 0

For the erection of small cottages at Leighton Buzzard, Beds. Mr. Frederick Gotto, architect:—

Adams	£589 0 0
Gibbs	462 10 0
Holdstock (accepted)	440 0 0

For stripping and repairs to the roof of a house, &c., at Tring, Herts. Mr. Frederick Gotto, architect:—

Honour	£190 0 0
Fincher (accepted)	138 15 0

For stables, Pont-street, Belgrave-square (Cadogan and Hans-place Estate), for Mr. J. H. Hiley. Mr. R. Baker, architect:—

Shaw	£7,197 0 0
Sewell & Son	7,154 0 0
Fish	7,124 0 0
McLachlan	7,105 0 0
Nightingale	7,071 0 0
Stimpson	6,980 0 0
Kirk & Randall	6,940 0 0
Downs & Co.	6,790 0 0
Pink	6,660 0 0
Perry & Co.	6,636 0 0
Martin, Wells, & Co. (accepted)	6,600 0 0

Sun-street Contract, for the Metropolitan Board of Works:—

Cooke & Co.	£13,030 0 0
Webster	12,300 0 0
Hook & Oldrey	11,643 0 0
Crockett	11,000 0 0
Aspinall	11,000 0 0
Stevens & Co.	10,000 0 0
Mowlem & Co.	9,985 0 0
Nowell & Robson (accepted)	9,785 0 0

For surface drainage, Dover:—

Hall	£3,146 0 0
Bourne	2,991 0 0
Adcock	2,983 0 0
Stiff	2,776 0 0
Chamberlain (accepted)	2,724 1 10

For the erection of twelve terrace-houses at Colney Hatch, for Messrs. Davies, Thomas, & Co. Mr. Henry Webster, architect. Quantities supplied by Messrs. Whitmore & Kennard:—

Guttrell	£6,574 0 0
Taylor & Co.	6,240 0 0
W. T. Niblett	5,750 0 0
Jefferson	5,600 0 0
Hobern	5,555 0 0
E. Niblett	5,475 0 0
A. Taylor	5,445 0 0
Sayer	5,225 0 0
Boyd	4,776 0 0
Frost	4,700 0 0

For building a chapel at West Kensington Park. Mr. Charles Bell, architect. Quantities supplied by Mr. Lovegrove:—

	Reduced Estimates.	Deducted from Original Estimate.
Staines & Son	£7,490	£1,566
Stimpson & Co.	7,146	1,810
Whittaker	6,639	1,348
Lucas & Son (accepted)	6,553	2,007

For Penistone Town-hall and Borough Offices. Mr. J. Hill, architect. Quantities by Mr. W. Hofmann Wood:—

Ashbury & Co.	£4,330 0 0
Wilcocks & Turner	4,300 0 0
Hook (accepted)	4,286 10 0
Middleton	4,285 0 0

For mansions on the Cadogan and Hans-place Estate, for the Cadogan Mansions Company, designed by the late Mr. John Ashdown. Carried on by Mr. W. Forbes F. Ashdown. Quantities by Messrs. John S. Lee & Son:—

Martin, Wells, & Co.	£29,200 0 0
Colls & Son	27,000 0 0
Fish	26,300 0 0
Lucas Bros.	26,224 0 0
Nightingale	25,940 0 0
McLachlan & Sons	25,900 0 0
Higgs & Hill	25,580 0 0
Peto Bros.	24,977 0 0
Shaw	24,828 0 0

For the erection of new casual wards, on the cellular system, and other works connected therewith, for the Guardians of the Fulham Union. Mr. A. C. Bean, architect. Quantities by Messrs. Messenger, Coe, & Robinson:—

Wheeler & Co.	£11,999 0 0
Chamberlain Bros.	9,579 0 0
Beman & Ewen	9,353 0 0
Aitchison & Walker	9,240 0 0
Avis & Co.	9,197 0 0
Cook & Son	9,022 0 0
Eyles	8,899 8 0
Torkington	8,875 0 0
Lathey Bros.	8,700 0 0
Nightingale	8,635 0 0
Tucker	8,633 7 0
Sawyer	8,587 0 0
Marsland	8,585 0 0
Hobern	8,570 0 0
Wyse	8,555 0 0
Parkinson	8,520 13 1
Johnson	8,515 0 0
Mears	8,500 0 0
Braid & Co. (accepted)	8,470 0 0
Priddle	7,999 0 0
Parker & Evans	7,694 0 0

For building shops and offices in Jewin-street (A), and warehouse in Well-street (B). Messrs. Ford & Hesketh, architects:—

	A.	B.
Perry & Co.	£7,545	£3,455
Peto Bros.	7,499	3,471
Conder	7,471	3,428
Mark	7,454	3,460
Adamson & Sons	7,416	3,449
McLachlan & Sons	7,360	3,444
Scrivener & Co.	7,348	3,415
Brass	7,294	3,401
Browne & Robinson	7,279	3,383
Hobson	6,777	3,252
Braid & Co.	6,401	3,063
Crabb	6,353	3,001
Ashby Bros. (accepted)	6,307	3,069

For restoring premises in Addle-street. Messrs. Ford & Hesketh, architects:—

Palmer	£2,293 0 0
Merritt & Ashby (accepted)	2,130 0 0

For rebuilding premises, Friday-street and Watling-street. Messrs. Ford & Hesketh, architects:—

Holland & Hannen (accepted)	£31,960	0	0

For building Baptist Tabernacle, Shoreditch. Mr. T. Lewis Banks, architect. Quantities by Mr. J. Sargeant:—

Dove Bros.	£9,600	0	0
Kirk & Randall	9,428	0	0
Downs	9,086	0	0
Higgs & Hill	8,764	0	0
Ashby Bros.	8,720	0	0
Bangs & Co.	8,689	0	0
Morter	8,569	0	0
Downs & Co.	8,510	0	0
Sargeant	8,340	0	0
Perry & Co.	8,330	0	0
Merritt & Ashby	8,100	0	0
Josolyne	7,882	0	0

For erecting five houses at County-grove, Camberwell, for Mr. J. R. Measures:—

Moncrief	£4,195	0	0
Fisher	3,995	0	0
Sheffield & Prebble	3,919	0	0
Smith	3,750	0	0
Taylor & Parfitt	3,725	0	0
Newstead	3,697	0	0
Phillips & Rice	3,127	0	0

For repairs, painting, &c., at the City of London Union, Homerton. Mr. G. Judge, architect:—

Boyce	£744	0	0
Harrison & Keen	738	3	6
J. & W. Cocks	696	10	0
Foster	695	0	0
Shurmur	648	0	0
Semour	615	0	0
Taylor & Parfitt	589	13	0
Tayler & Sons	544	0	0

For new Board Schools, Albion-road East, Shepherd's-bush. Mr. E. R. Robson, architect:—

Mark	£10,672	0	0
F. & F. J. Wood	9,563	0	0
Pritchard	9,055	0	0
Thompson	8,930	0	0
Kirk & Randall	8,878	0	0
Grover	8,848	0	0
Boyce	8,480	0	0
Hook & Oldrey	8,422	0	0
Higgs & Hill	8,260	0	0

For new Board Schools, Somerford-street, Bethnal-green. Mr. E. R. Robson, architect:—

Grover	£13,303	0	0
Williams & Son	12,989	0	0
Hook & Oldrey	12,960	0	0
Higgs & Hill	12,957	0	0
Kirk & Randall	12,531	0	0
Sheffield & Prebble	12,487	0	0
Brass	12,425	0	0
Hobson	12,379	0	0
Pritchard	12,319	0	0
Cox	12,177	0	0

For house and boundary walls at Mortlake, for Mr. F. Stratton:—

		Boundary walls.
Davis	£2,700	—
Hoare & Sons	2,400	£260
Hobson	2,350	268
Hook & Oldrey	2,320	260
Mallett	2,150	150

For additions and alterations to house at Maida-hill, for Mr. B. Davis. Mr. H. H. Collins, architect:—

		Allowed for Old Materials.
Robinson	£3,797	£33
Temple & Forster	3,680	38
Abrahams	3,393	90
Mark	3,363	20
Merritt & Ashby	3,333	55
Knight & Co.	3,317	10
Hook & Oldrey	3,300	—
Green & King	3,135	50

For the erection of large shop, warehouse, stabling, cart-shed, and outbuildings, with two shops adjoining, at Leytonstone, for Mr. Stoffel. Mr. D. R. Dale, architect. Quantities by Mr. Birdseye:—

Arber	£7,275	0	0
Bangs & Co.	7,237	0	0
Hart	7,172	0	0
Pritchard	7,125	0	0
Morter	7,117	0	0

The Wool Exchange, &c., Western Extension, for Col. A. Angus Croll. Contract No. 2. Mr. Francis T. W. Miller, architect. Quantities supplied:—

Stephenson	£8,860	0	0
Simpson & Sons	8,383	0	0
Hill & Higgs	8,280	0	0
Perry & Co.	8,230	0	0
Langmead & Way	8,150	0	0
Hook & Oldrey	7,580	0	0
Higgs (accepted)	7,169	0	0

For repairs and additions to houses at Sanford-lane and Sanford-place, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Mr. J. Groom, architect:—

McCormick	£1,866	0	0
Ware	1,550	0	0
Grimwood	1,533	0	0
Cole	1,492	0	0
Mattock Bros. (accepted)	1,443	0	0

For additional stabling for the London General Omnibus Company, at Holloway. Mr. Alfred Tosh, architect. Quantities supplied:—

Shurmur	£396	0	0
Perkins	377	0	0
Crabb	365	0	0
Aitchison & Walker	345	0	0
Gadd	340	0	0
Cole	315	0	0
Wise	310	0	0

For shop-front and repairs to Crimea Villa, Woodgreen. Mr. W. Smith, architect:—

Mattock Bros. (accepted)	£297	0	0

For new billiard-room and alterations to The Elms, Sutton, Loughborough, for Mrs. C. Tillotson. Messrs. Freeman & Naylor, architects:—

Allen	£1,294	0	0
Black	1,194	0	0
Vernon (accepted)	1,145	0	0

Omnibus Company's Stables. — Messrs. Sampson & Parrish state that they tendered in this case; amount of tender, 1,700*l.*

Works in York.—Mr. W. Lewis is the architect for several works, for which the tenders were printed in our last. No intimation of the fact was given in the lists sent.

TO CORRESPONDENTS.

W. C. Wisconsin (we will give his letter publicity, but we cannot assist commercially).—J. H. (we cannot interfere in private disputes as to wages. He should have inquired the exact wages allowed before going to work).—J. A.—F. C.—H. C.—Rev. Dr. P.—W. P. B.—Mr. R.—M. J.—H. W.—C. C.—W. & J. K.—F. & S.—O. E.—J. W.—J. S.—J. S.—J. B.—F. C. P.—Contractor.—J. W. S.—F. T. M.—T. & P.—W. S. J.—W. J.—W. A.—H. H.—C. B. & Co.—G. W. B.—H. M.—J. H. H.—W. C. K.—T. Van P.—M. Bros.—F. & H.—N. & R.—F. & N.—A. C. B.—W. L. S.—C. B.—J. S.—H. & Sons.—H. & O.

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Addressed to No. 46, Catherine-street, W.C.

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1st Issue at par	4,000	shares.	Amount	£100,000
2nd	„	£1 prem.	4,000	„	„	100,000
3rd	„	£2 „	4,000	„	„	100,000
4th	„	£3 „	4,000	„	„	100,000
Total	16,000		Total	£400,000

The Fifth Issue of 4,000 shares is in course of allotment at 4*l.* per share premium, of which upwards of ONE-THIRD have been already allotted.
Reserve Fund at end of last year, 16,370*l.* (since increased by several thousand pounds). Various further profitable re-sales have been made.
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